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COMPUTERWORLD

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Ex-IBM exec sees '88 barrage

3090F line, MVS/XB expected to precede 1990 Summit rollout

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — IBM users should expect a heavy schedule of high-end system announcements — including an "F series" line of 3090 mainframes — early next year, according to a former IBM large systems marketing executive who retired earlier this year.

Daniel M. Culhane, former manager of large systems marketing at IBM, last week outlined a sweeping series of high-end enhancements, including the 3090F line, an updated version of MVS/XA, reduced mass storage prices and higher channel speeds.

An IBM spokesman said last week that the company will not comment on unannounced products. However, an IBM customer who had been briefed by IBM confirmed much of Culhane's information.

Culhane retired in February after 26 years of service with IBM and is now vice-president of the IBM large computer market service of the Gartner Group, Inc., a Stamford, Conn.-based market research and consulting firm. As manager of large systems marketing with IBM, Culhane participated in the planning, advanced systems development and announcement of the 3080 and 3090 lines.

Speaking to an audience of senior information systems executives at the National Retail Merchants Association meeting here

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Compaq bus drives away from IBM

BY ED SCANNELL
CW STAFF

NEW YORK — Continuing its defiance of IBM's Micro Channel architecture, Compaq Computer Corp. last week announced a series of powerful systems based on Intel Corp.'s 80386 chip with an enhanced bus architecture that it claimed significantly increases the performance of industry-standard software and peripherals.

The Compaq Deskpro 386/20 is built around Compaq's Flexible Advanced Systems Architecture, which combines a memory-caching scheme, concurrent memory and separate I/O bus to markedly increase the speed of popular applications such as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase III.

The architecture uses Intel's just-released 82385 disk cache controller chip and Sunnyvale, Calif.-based Weitek Corp.'s optional 1167 coprocessor board. Compaq claimed the Weitek product enables the Deskpro 386/20 to outperform a Digital Equipment Corp. coprocessor-equipped Vaxstation II/GPX by a factor of more than 4-to-1.

In addition to the Deskpro 386/20, the company unveiled what it claims is the industry's first 20-MHz 80386-based portable system, the Compaq Portable 386. The 20-lb system has a tiltable screen, a snap-on module for expansion boards, a socket for an 80387 coprocessor and 40M bytes of standard storage capacity, expandable up to 100M bytes.

Along with the new systems, the company introduced a new version of Microsoft Corp.'s MS-

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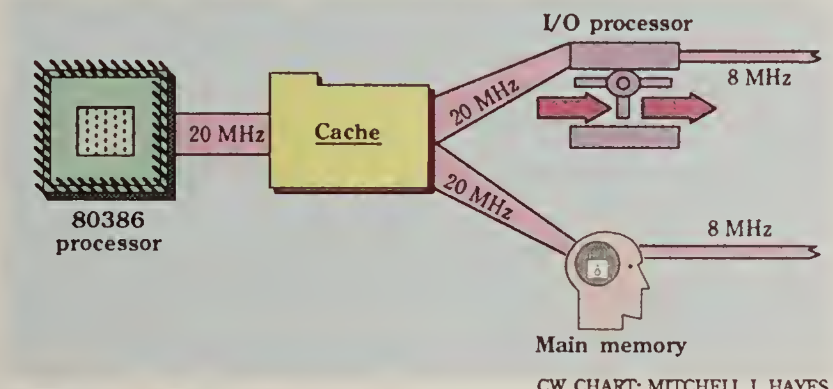
Rapid transit

Compaq's Flex Architecture uses caching and a concurrent bus structure to maximize CPU performance



CW CHART: MITCHELL J. HAYES

Apple to lure MIS, tie Mac to host CPUs

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. is putting the finishing touches on Macworkstation, a software product that allows a Macintosh to be used as a front end to a host computer while retaining the Macintosh graphical interface.

With plans to offer Macworkstation at a low price, Apple expects to use the product to further the Macintosh's appeal as a product for the corporate MIS world.

"We're offering this as an enabling technology to encourage people to develop on the Macintosh," said Peter Hirshberg, manager of Apple's desktop communications and large systems group.

"The role of the Macintosh as a window to a corporation's information systems department is an important opportunity," Hirshberg added.

Macworkstation resides on the Mac and can work with any host computer using a customized mainframe application.

The product is currently in beta testing, with release planned for Jan. 1, according to Norman Klein, product manager for the Macworkstation.

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Cullinet plans life after DB2

BY ROSEMARY HAMILTON
CW STAFF

ANAHEIM, Calif. — Cullinet Software, Inc. last week threw its full support behind IBM's SQL and outlined a series of other sweeping changes that will broaden its product line beyond the mainframe data base management system market.

If Cullinet has its way, the "new" company will provide SQL-based DBMS and a host of development tools for multiple platforms, including IBM mainframes and microcomputers and Digital Equipment Corp. VAXs.

By adhering to other standards and protocols such as LU6.2, Cullinet says it also intends to provide cooperative processing and distributed data base management capabilities so that the three environments can function as one.

The company also declared its goal of becoming the premier vendor in the applications software market. Cullinet stated that all future applications will support SQL and that it will deliver the "next frontier" — artificial intelligence-based applications — within 12 to 18 months.

Cullinet's current applications products include human resources, finance, manufacturing and banking tools. At the same time, the firm is lining up what officials said will be dozens of offerings for the computer-integrated manufacturing market.

Grasp exceeding reach?

The ambitious plan, presented to approximately 3,500 customers gathered here for the annual Cullinet User Week, met mixed reviews. Some users questioned whether the company's strategy is too bold to implement successfully.

"I have concerns about so many products," said Frank Hall, director of data administration at Wrangler, a VF Corp. subsidiary. "Lots of companies have problems when they get too big, and it looks like Cullinet is getting too big."

If successful, Cullinet will emerge by the end of the decade

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NEWSPAPER
SECOND CLASS

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> *"If you talk sense, IBM will listen . . . especially if that sense has enough zeros behind it."*
>
> BOB DJURDJEVIC
> ANNEX RESEARCH, INC.
>
> *See story page 4.*

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L.A. sites rocked

But earthquake damage minor at most centers

LOS ANGELES — The killer earthquake that jolted Southern California last week disrupted communications and electrical power but caused relatively few incidents of extensive damage at computer centers in the Los Angeles area.

The greatest damage reported last week was at California Federal Savings & Loan, where the data processing center suffered extensive structural damage. Located in Rosemead, Calif., within two miles of the earthquake's epicenter and about 15 miles away from downtown Los Angeles, the bank's DP center's mainframes incurred damage and were out of service.

Disaster recovery specialists reported that most data centers on their client lists escaped serious damage. The Thursday morning earthquake measured 6.1 on the Richter scale.

A full day after the quake, many MIS groups were still evaluating their situations with a wary eye toward the threat of a second earthquake.

'Devastating'

Frank Piluso, senior vice-president of computing and communications at California Federal Savings & Loan, said mainframes at the Rosemead DP center were damaged by collapsed ceilings and water from broken plumbing lines. The initial tremor caused floors to buckle and mainframes to tip over.

"It was absolutely devastating. We must have been right at the epicenter of the earthquake," Piluso said.

Piluso and a team of about 400 technicians and vendor representatives were working out of a tent Friday near the data center building, trying to put the center back together. The damaged machines included models from IBM, Digital Equipment Corp. and Unisys Corp. Tapes carrying the mainframe data were transported Thursday to the bank's backup facilities in San Diego and Phoenix and were scheduled to be accessible to California Federal's branches starting today if Piluso's team could not resume operations.

Security Pacific Automation Co.'s main data center in Los Angeles continued operating "with a couple of minor errors," Vice-President Thomas O'Hara said. Security Pacific Automation provides data processing services to Security Pacific National Bank and its sister companies.

But at the company's Beaudry, Calif., satellite data center, DEC 785 disk drives "started rolling around the floor," and a disk fell to the floor, according to accounts that O'Hara received in New York.

At Quotron Systems, Inc.'s Los Angeles data center, the quake produced cracks in the building and shook loose ceiling tiles in the data center, according to supervisor Gary Hargis.

"The quake shook all our systems around, and the disk drives, which had been sitting in line, were all turned around at 35- or 40-degree angles," Hargis said. The operations staff shut down the disk drives — aging Control Data Corp. Model 874s that are "very mechanical units" — shoved them back into place and then turned them on again without loss of any stored data. "That was very surprising. They're pretty old units," Hargis said. Quotron's leased line to the New York stock exchanges went down, causing a brief interruption of its stock quote service, but it was quickly reestablished, Hargis said.

Two of Pacific Bell's central switching offices were put out of commission for an hour early in the day — the Plymouth facility in south central Los Angeles and one in Rosemead in the northeastern part of the city. Other offices took over their switching tasks, and the company reported that emergency service continued to function throughout the area after the quake.

Could have been worse

Executives at disaster recovery firms said they believe a slight increase in the force of the tremors could have produced severe damage. "My perception is that from a . . . DP standpoint, one more tick on the Richter scale would have made a big difference," said Ray Hipp, president of Comdisco Disaster Recovery Services, Inc., a division of Comdisco, Inc. in Chicago.

One bank declared a disaster when the quake caused its computers and peripherals to shift position, according to Bill Flounders, financial officer for Sungard Recovery Services, a division of Sungard Data Systems, Inc. in Wayne, Pa.

Bank officials contacted Sungard after the quake when they lost power in their data center and discovered during a flashlight examination that the equipment had moved. Because traditional telephones were out of order, the bank used a mobile cellular telephone to reach Sungard officials and arrange to bring tapes and personnel to Sungard's San Diego facility where recovery operations began Thursday evening.

This report was prepared by West Coast Correspondent Stephen Jones and Senior Editors James Connolly, Charles Babcock and Elisabeth Horwitt.

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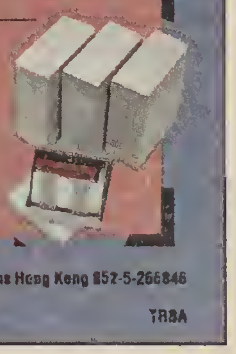

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*PC ORACLE requires an "OS/2 ready" 286/386-based PC running DOS 3.1+ with 1MB extended memory (2MB is recommended) and a minimum 10MB hard disk drive.

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ADAPSO scores IBM code policy

BY CLINTON WILDER
CW STAFF

COLORADO SPRINGS — Frustrated leaders of the independent software industry demanded last week that IBM soften its 4-year-old policy of restricted access to its mainframe operating systems source code.

In a speech at ADAPSO's 67th biannual management conference, ADAPSO Chairman Jay Goldberg said IBM's recent arbitration settlement with Fujitsu Ltd. [CW, Sept. 21] weakens IBM's argument that it must keep its proprietary source code under lock and key. The arbitrators ordered IBM to give Fujitsu source code access to more than 700 IBM programs for substantial fees, the amounts of which will be set in the next few months.

"It is unthinkable that Japanese software developers be given access to IBM operating systems source code while American companies . . . are excluded from such access," Goldberg said.

Litigation possible

Goldberg said ADAPSO will launch an all-out, international lobbying effort to pry open the door to IBM source code and allow software vendors to negotiate for Fujitsu-type access. He said ADAPSO will consider suing IBM if its efforts fail.

"If IBM stonewalls us, if we don't get relief from somewhere else, and if Fujitsu continues to get source code, then we would consider litigation," Goldberg said in an interview.

However, IBM has no plans to change its object code only policy, IBM spokesman John Mihalec told *Computerworld*. "We regret that we are not permitted [by the arbitrators] to comment specifically about any provision of the order, but we would ask that ADAPSO reserve judgment until we get further information about what IBM and Fujitsu will have to do," he said.

Jay Goldberg

Mihalec added that IBM's relationship with ADAPSO is "very important" to the company and that ongoing discussion with the software association will continue.

Fujitsu is expected to pay IBM hundreds of millions of dollars for its source code access, according to industry sources. Although U.S. software vendors can hardly match the resources of the multibillion-dollar Japanese electronics giant, software executives said they would prefer to negotiate on economics rather than on principle.

"If the price is astronomical, at least I have a choice," said Pansophic Systems, Inc. Chairman David J. Eskra, a leading advocate of IBM source code access for his utility software firm.

One veteran IBM observer suggested that the company may be willing to relent for the right price. "This access is not for free; IBM is not being kind to Fujitsu," said Bob Djurdjevic, president of Phoenix-based Annex Research. "I don't see why IBM wouldn't listen to ADAPSO if they brought along a big enough satchel."

The source code issue has been a bugaboo for ADAPSO and many users since 1983, when IBM, in the wake of alleged piracy of its mainframe operating systems by Hitachi Ltd., announced the object-code-only policy. In the past four years, IBM has restricted access to an increasing amount of systems software source code, claiming the threat of competition, particularly from the Japanese.

Romney White, president of Boston-based VM/CMS Unlimited, Inc. and a perennial object-code-only critic, called the Japanese competitive threat a red herring. "IBM's real fear is that users will modify the software to fit their legitimate business needs, slowing down their ability to migrate to new hardware and new software releases," he said.

Goldberg charged that numerous meetings between ADAPSO officals and IBM "have produced little but window dressing." ADAPSO plans to take its case against IBM to a variety of public sector channels, including the U.S. Congress, Department of Justice and Federal Trade Commission, the European Economic Community and the attorney generals of various states.

Bundling charges leveled

ADAPSO last week charged IBM with bundling software into three major operating systems, including the much-anticipated OS/2 Extended Edition.

The organization also restated its opposition to IBM's policy of source code restrictions.

In a revision of a 1983 statement on source code restrictions and software bundling, ADAPSO published a position paper charging IBM with bundling several utility functions into VM/IS, the operating system intended for use on IBM's 9370 minicomputer series, and VSE/SP. The paper specifically objects to IBM's inclusion of utility features in the operating system packages. Several independent software companies compete with IBM's in those areas.

The position paper also claims that IBM is bundling functions by planning to include data base management and communications software as part of OS/2 Extended Edition, the future operating system for IBM's Personal System/2 line.

ADAPSO did not reveal the final wording of the position paper, which will be released in November, according to Martin Goetz, senior vice-president of Applied Data Research, Inc. and a member of the panel that drafted the paper.

An IBM spokesman disputed the charges, stating that customers are free to choose operating systems packaged with the utilities or to buy the programs separately. He said the price difference is negligible.

PAUL GILLIN

Lotus readies Kapor's swan song

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — Early next month, Lotus Development Corp. is expected to unveil what may be Mitchell D. Kapor's final product for the company he founded in 1982.

The still-unnamed product, a free-form textual data base with some word processing capability, is the culmination of a long-term joint development effort between Kapor and Jerrold D. Kaplan, former chief technologist for Lotus.

The product, referred to within Lotus as simply the "Mitch Product," will compete with a variety of free-form data base packages such as Dayflo Software Corp.'s Tracker, Seaside Software, Inc.'s Asksam and Ize from Persoft, Inc. The package requires an IBM or compatible personal computer running Microsoft Corp.'s MS-DOS 3.0 or above. Kapor, contacted last week, declined comment.

However, Lotus chairman Jim P. Manzi, in a speech last week, confirmed development of the product. Manzi described the product as a Personal Information Manager that is able to manage tasks, ideas, people, projects and goals. According to Manzi, the product can collect and categorize information on the fly and uses artificial intelligence to organize the textual information. Additionally, the product can update related files when a particular item is changed.

The product is "only months away from delivery," Manzi said, and informed sources reported that the product will be announced at Comdex/Fall '87, which begins Nov. 2. Although a price has not been set, the product will be priced somewhat less than Lotus 1-2-3's $495 price tag, the source said.

With the product, users can type notes and memos or import files. The data base component allows data to be stored and retrieved according to a variety of key words and priority levels.

While most products in this category have sold in small quantities, a well-executed product could break through the market bottleneck. "The category is information management, and it may be the next big horizontal application," said Jeffrey Tarter, publisher of "Soft-Letter."

According to sources, Kapor is responsible for the design of the data base component, while Kaplan, a noted AI expert, provides the product's advanced features, such as dynamic scheduling, prompting and the ability to understand English-style queries. Kaplan is responsible for the bulk of the programming.

CORRECTIONS

Sybase, Inc. said it has made no announcement regarding an agreement with Microsoft Corp. and that it has not announced plans to move its data base to the IBM Personal System/2 [CW Sept. 28].

Sybase has committed to incorporating the Apple Computer, Inc. Macintosh into its environment but has made no announcement regarding moving the data base onto the Macintosh.

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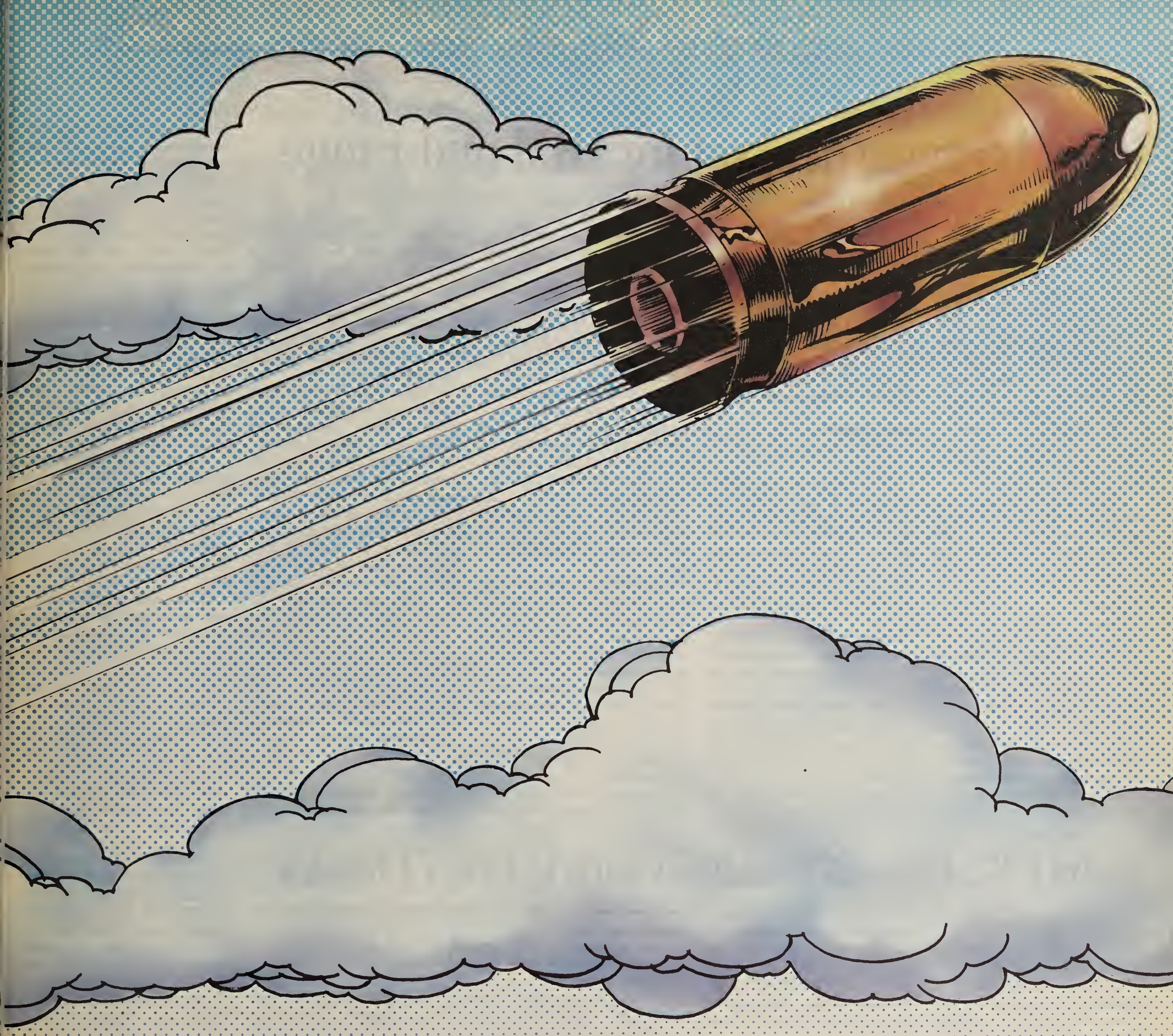

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Eased service deal set for IBM mid-range

Mid-Range System Amendment plan loosens sign-up requirements; minimum fees hiked

BY STANLEY GIBSON
and JEAN S. BOZMAN
CW STAFF

IBM last month quietly initiated a maintenance discount plan that eases sign-up requirements for customers but offers less favorable discounts than those available under the company's Corporate Service Amendment (CSA).

The alternative program is seen as an effort to convince more mid-range customers to sign up for IBM service.

Called the Mid-Range System Amendment (MRSA) to the IBM Maintenance Agreement, it will go into effect Nov. 1, according to a letter to customers dated Sept. 15 but not publicly announced.

Also on Sept. 15, IBM changed minimum maintenance charges on System/36 and 38 processors, raising some fees and lowering others. These minimum charges are set to become effective Nov. 1.

The new minimum maintenance charges result in increases for most customers, according to calculations performed by Donald Goodspeed, president of Computer Maintenance Consultant, Ltd., located in White Plains, N.Y.

In February, IBM cut maintenance prices by 20% on System/34 and 36 processors and by 12% on System/38s. IBM also cut the maintenance fees on printers and displays that work with the minicomputers by 17%.

Comparison

The MRSA compares with CSA as follows:

- CSA is offered in one-, three- and five-year plans, with discounts ranging from 5% to 45%. MRSA is offered in three- and five-year plans. Discounts under MRSA average 17% less than those under CSA, according to calculations performed by Goodspeed.
- Under CSA, users are required to pay $3,500 to take an examination on hardware management procedures and are charged $8,600 for a network management test. Those taking both tests need pay only $8,600. There is no charge to sign up for MRSA.
- Together, the CSA system and network tests total 372 questions and are administered by an IBM specialist. The MRSA contract includes a list of 10 questions that a user may answer himself.
- CSA network customers are required to use the Electronic Customer Communications Option for network management.

MRSA customers are not required to use the system.

- MRSA, which is offered in three- and five-year plans, includes 24-hour-per-day, seven-day-per-week service, also standard under CSA.
- MRSA includes no separate network option, although networks can be included under the plan.
- Under MRSA, a customer may decline to provide some information requested by the questionnaire because of the customer's security requirements. Privacy had reportedly been a sticking point for a number of users interested in signing up for CSA discounts.

'Competition better'

"I think this is a good program for the small retail buyer who doesn't know what's going on in the marketplace today," Goodspeed said. But, he added, "I think the competing programs are already infinitely better than the existing CSA."

Several maintenance providers introduced competing discount plans earlier this year to compete with CSA.

"IBM's doing it for account control, to accomplish more hardware sales," asserted Bill Patch, vice-president of marketing planning at Sorbus, Inc. Customers who have third-party maintenance are only 50% as likely to buy additional equipment from their existing vendor, while users who have maintenance provided by their equipment vendor are 90% likely to buy more equipment from that vendor, according to Patch.

He said he has seen about half of Sorbus's customers who have IBM mid-range systems convert to Digital Equipment Corp. VAXs. "Eliminating independent [maintenance] competition is also a goal," he said.

Locking in

Jim Paster, marketing manager for the IBM segment of Control Data Corp.'s Engineering Services Division, said his main concern is that the MRSA will lock in IBM accounts for three or five years, freezing out independent competition from third-party maintainers. The same policy, Paster added, will also signal whether an IBM account is about to switch to equipment from another vendor, such as DEC.

David Funderburk, MIS director at Trammell Crowe Co. in Dallas, said he does not think he will qualify for the CSA but believes he can qualify under MRSA. He said he intends to sign up for it, possibly converting to CSA later.

A System/36 user said that he had been notified only of the minimum maintenance charge restructuring, but not of the MRSA. He said he also received notification that his monthly maintenance fee will increase by $29.

Goodspeed calculated that a user of a typically configured System/36 who pays $24,000 annually in maintenance fees and incurs an average increase of 17% on his maintenance charges will pay $4,080 more per year than under CSA.

By not having to pay the CSA sign-up fee, he said, a user will save $8,600, however. Signing up for CSA would thus pay back in just more than two years.

Rolm CBX face-lift readied with ISDN, T1 hooks

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Taking firm control of its subsidiary's destiny at last, IBM is expected to announce tomorrow the first Rolm Corp. private branch exchange (PBX) architecture to incorporate built-in compatibility with standard telecommunications links, including Integrated Services Digital Network (ISDN).

The computerized branch exchange (CBX) model, slated to be announced here, will incorporate a completely new switching engine that supports the 64K bit/sec. clear channel specified by the ISDN B channel standard, according to Fred Chanowski, president of Telecommunications Management Corp. in Needham Heights, Mass. It will reportedly have a significantly smaller footprint and an even greater switching capacity than Rolm's CBXII 9000AE, which can support up to 20,000 lines.

The new CBX's architecture consists of multiple switching modules that are connected by a bus resembling an internal local-area network, according to Frank Dzubeck, president of Washington, D.C., consulting firm Communications Network Architects, Inc. This will allow customers to start small and add line capacity incrementally, he added.

The University of Massachusetts, which is preparing to accept bids on a major PBX contract, was recently told by Rolm that the firm was about to announce a smaller CBX incorporating some architectural differences.

'Space hogs'

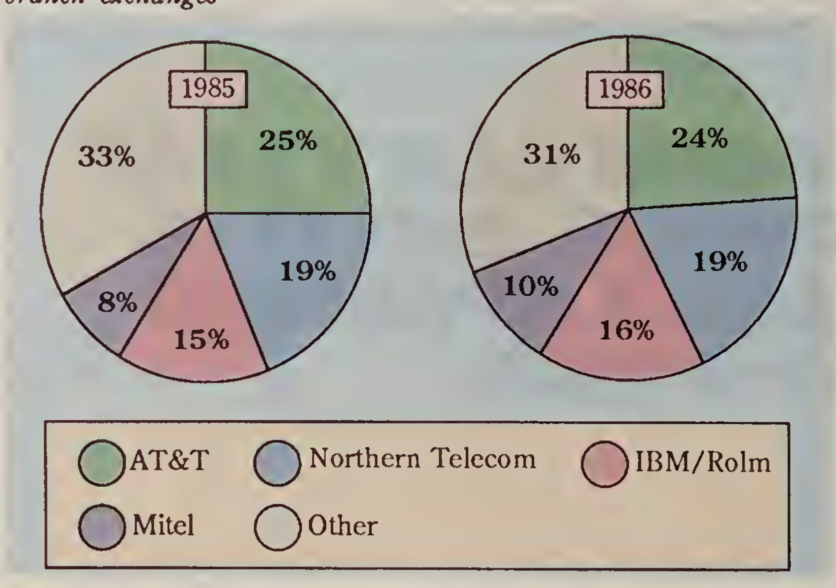
John Miller, project director at the university's Amherst campus, was most interested in the new size. "Right now, Rolm systems are space hogs," he said.

Rolm's switches have reportedly always supported 96K bit/sec. transmission, while the rest of the industry supports the 64K bit/sec. Pulse Code Modulation standard. This makes it difficult for the Rolm products to interface the existing CBX line with T1 switches, other leading PBXs and networking services such as AT&T's Accunet, industry sources said.

Rolm began promising a standard switch architecture as early as two years ago, according to a network planning executive at a Fortune 100 company. However, uncertainty as to when the product would be available may have put off potential buyers of the current CBX who "wondered what would happen to their old systems when the new one arrived," according to that manager, who requested anonymity.

Breaking step

Products expected from IBM's Rolm division are seen as an effort to generate momentum in the relatively stable market for private branch exchanges



INFORMATION PROVIDED BY NORTHERN BUSINESS INFORMATION
CW CHART

This fear is justified, according to Telecom Management's Chanowski.

No 'upgradability'

"The new switch will be what we call 'forklift-upgradable.' That is, you have to take out the old switch and all components, from time cards to processor, and junk them," he said. While customers will reportedly be able to migrate their old CBX application software to the new system, "This is the first time that Rolm is not offering hardware upgradability," Chanowski said.

Implementing ISDN B channel support in Rolm's CBX architecture is the first step in IBM's five-year plan to make the subsidiary "IBM's ISDN champion, offering a full line of ISDN-compatible products," noted Morristown, N.J.-based Probe Research, Inc. in a recent report. During that time, IBM plans to implement the ISDN primary and basic rates as well as Signaling System No. 7, an ISDN protocol that defines how different networking devices exchange control and management data, Probe said.

The ISDN drive is one element of IBM's strategic campaign to increase Rolm's size by at least 20% per year and its market share by at least 5% per year for the next five years, Probe said. The research firm predicted that Rolm will increase its market share in relation to AT&T and Northern Telecom by 4.5% by 1992 — largely at the expense of AT&T.

IBM is said to have begun marketing the new CBX aggressively, offering 100% substitution for the same price to customers who have already signed up for the older CBX line. Reportedly scheduled to be available by the second or third quarter of 1988, the system is said to be up and running already at more than 100 sites, a number of them within IBM.

The new Rolm engine does not fill another crucial gap in the IBM-Rolm strategy, analysts said: that of a full-function link between the CBX and IBM's Systems Network Architecture (SNA). "The Rolm CBX currently is not an SNA product, so it has to go through Netview/PC [to link up to control features of the SNA world]," explained Donna Brown, Rolm's manager of network management marketing. However, Rolm is working on ways to meet customer demand for improved IBM-Rolm connectivity, she added.

IBM-Rolm would not comment on the upcoming announcements.

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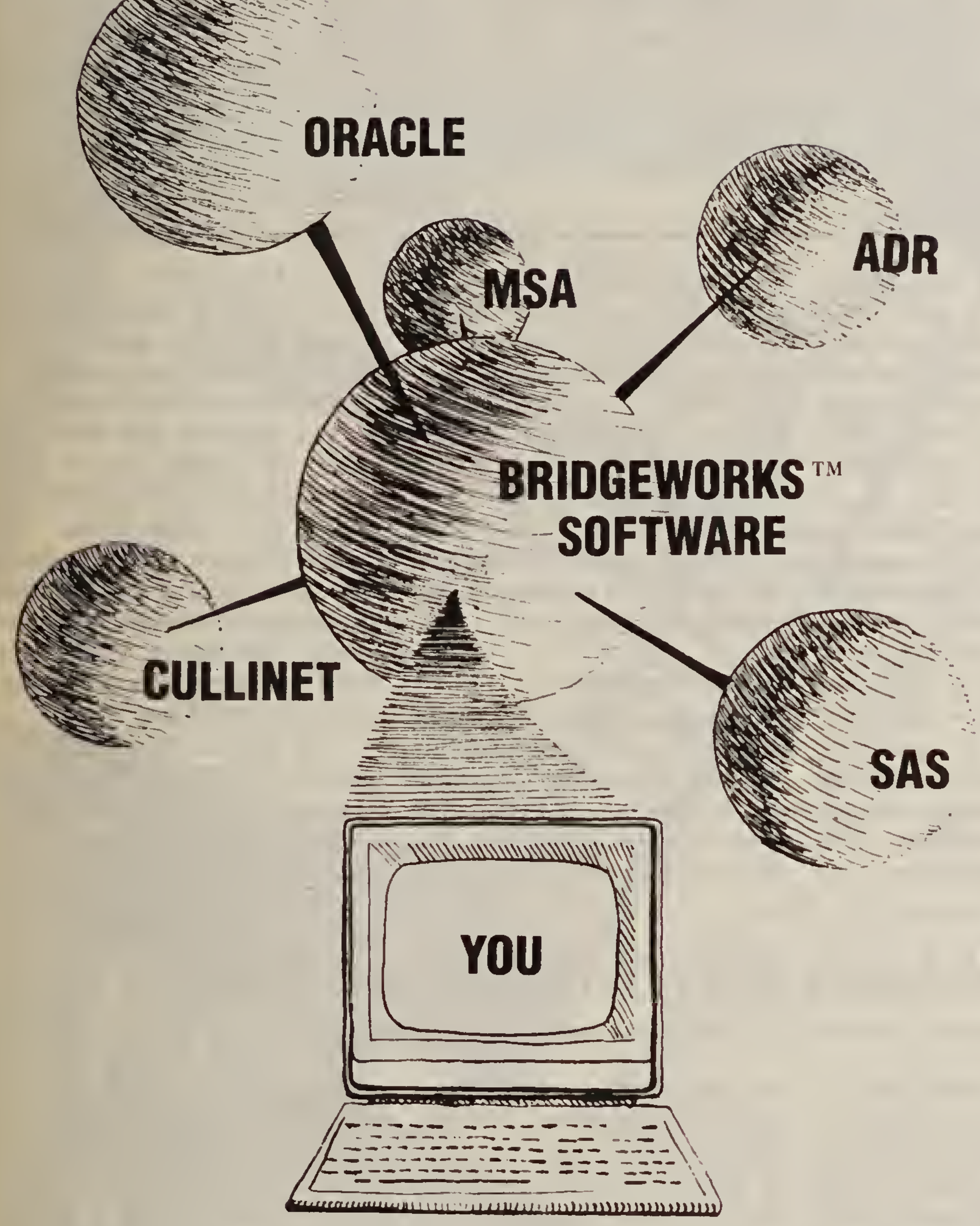

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OEMs expect OS/2 code next month

BY ALAN J. RYAN
CW STAFF

Key software developers and OEMs will receive the latest update to Microsoft Corp.'s MS OS/2 code in November, and users can expect the availability of applications soon thereafter.

Microsoft's Adrian King, director of product marketing for operating systems, confirmed last week that the final release or update to the MS OS/2 Version 1.0 software development kit will be on the market in November, as will the first OEM release of the 1.0 product.

And the OEMs are ready. Glenn Nelson, a spokesman at Zenith Data Systems, said Zenith is "on schedule for shipment [of MS OS/2 for Zenith products] in December at the latest," if it receives MS OS/2 in November.

Ed Cagle, director of marketing programs at Austin-based PC's Limited, claimed his company has been verifying its compatibility with MS OS/2 as it has received new versions of the code. "We're not making any significant changes that would make it delayed on our schedule," he said.

No rush

However, some say there is no rush to work with the operating system. Tandy Corp. spokesman Ed Juge said that whether or not OEMs make MS OS/2 available to customers weeks or months after the final code is readied is not an issue. Microsoft Chairman and Chief Executive Officer Bill Gates "is telling customers not to buy it right away anyway, because there is nothing you can do with it," Juge said.

It is likely that any software on the market when MS OS/2 is available will simply be ported versions of existing packages.

"Borland International will likely have Paradox [relational data base] ready before Microsoft ships [MS] OS/2," according to company President Philippe Kahn.

And Computer Associates International, Inc., which showed an advanced version of its Superproject Plus running in real and protected mode under OS/2 at the IBM Personal System/2 and OS/2 announcement in April, has said it plans to have products soon after MS OS/2 ships.

Jeff Tarter, publisher of Cambridge, Mass.-based "Soft-Letter," said the ability to ready applications for the operating system does not mean much. "They are still the same applications. They haven't really done anything with them," he said.

Compaq bus

CONTINUED FROM PAGE 1

DOS that breaks the 32M-byte barrier on disk volumes, allowing users to configure hard disks as large as 512M bytes. Compaq also announced it was bundling Microsoft's Windows/386 with both the Deskpro 386/20 and Portable 386.

Users generally indicated they believe the speed and performance of the two new systems give Compaq an opportunity to further its lead in the 80386-based market. The company introduced its first 80386-based desktop system in September 1986 and its first 80386-based portable in February. IBM released a 16-MHz 80386 system in July but is not expected to deliver a 20-MHz version until later this year.

"I think they did a really good job," said Jerry Schneider, president of the Capital PC User Group, Inc., based near Washington, D.C. "They aren't allowing their design to be frozen in concrete like IBM."

Enhancing techniques

Compaq officials remain unshaken in their view that the original IBM Personal Computer architectural standard will continue to flourish, particularly if it continues to be enhanced with techniques such as Compaq's Flexible Advanced System, known in the industry as Flex.

Compaq President Rod Canion indicated his company would not be delivering a Micro Channel-compatible product any time soon. Recent sales of Compaq systems lend some credibility to Canion's claim. Sales for the second quarter this year rose 84% over those of last year's second quarter despite IBM's introduction of the Personal System/2 series in April.

Top of the line

Speedy versions of the 80386 chip power Compaq's latest desktop and portable models

Model	*Processor*	*Standard configuration*	*Memory*	*Storage options*	*Price*
Compaq Deskpro 386 Model 20	Intel 80386 20 MHz	One 1.2M-byte, 5¼-in. floppy 60M-byte hard disk	1M-byte to 16M-bytes	1.44M-byte, 3½-in. floppy 130M-byte, 300M-bytes and disk	$7,999 to $12,499
Compaq Portable 386	Intel 80386 20 MHz	One 1.2M-byte, 5¼-in. floppy, 40M-byte hard disk	1M-byte to 10M-bytes	40M-byte hard disk	$7,999 to $9,999

INFORMATION PROVIDED BY COMPAQ COMPUTER CORP.
CW CHART

"Remember that this growth occurred without any of the new software available, which is why we think 1988 and '89 are going to be even better," said Ben Rosen, Compaq's chairman.

Perhaps the most interesting aspect of the Compaq announcement is the Flex architecture. Explaining the memory caching portion of the architecture, a Compaq spokesman said that when users retrieve data from memory, a copy is stored in cache memory, which is made up of 32M bytes of static random-access memory (RAM). The next time that information is requested, it is more quickly retrieved from cache memory.

"This dual-bus approach enables the processor to run at its full 20-MHz speed during almost all memory cycles, while the peripheral I/O bus runs at the industry standard 8-MHz speed," Canion noted.

Another advance the company highlighted was the 300M-byte internal disk drive available for the Deskpro 386/20. The drive has a 1-to-1 interleaving factor, a transfer rate of 10M bit/sec. and an average access time of 20 msec. It also has a "look-ahead buffer" that works in conjunction with the disk caching software to provide greater throughput speeds.

Three-model line

The Deskpro 386/20 is available in three models. The Models 60, 130 and 300 all have 1M byte of memory with an additional 32K bytes of static RAM and a 5¼-in., 1.2M-byte disk drive.

The Model 60 has a 60M-byte fixed disk and is priced at $7,499; the Model 130 has a 130M-byte fixed disk and lists for $9,499; and the Model 300 has a 300M-byte fixed disk drive and costs $12,499. Users can purchase optional 3½-in. floppy disk drives for all three models.

The Model 60 has four available 8- to 16-bit expansion slots and two 8-bit slots, and the Model 130 and 300 have three 8- to 16-bit slots and two 8-bit slots.

The Portable 386 series includes the Models 40 and 100, each containing 1M byte of RAM and a 5¼-in. disk drive. The Model 40 has a 40M-byte fixed disk drive with an average disk access time of 30 msec, while the Model 100 has a 100M-byte fixed disk drive with an average seek time of 25 msec.

The Models 40 and 100 are priced at $7,999 and $9,999, respectively. All five systems are available immediately, according to the company.

Compaq Portable loses weight battle, dies at 4

BY ED SCANNELL
CW STAFF

The Compaq Portable Computer died last week after a long and profitable life. The first personal computer to be 100% compatible with the IBM Personal Computer was one month short of its fifth birthday.

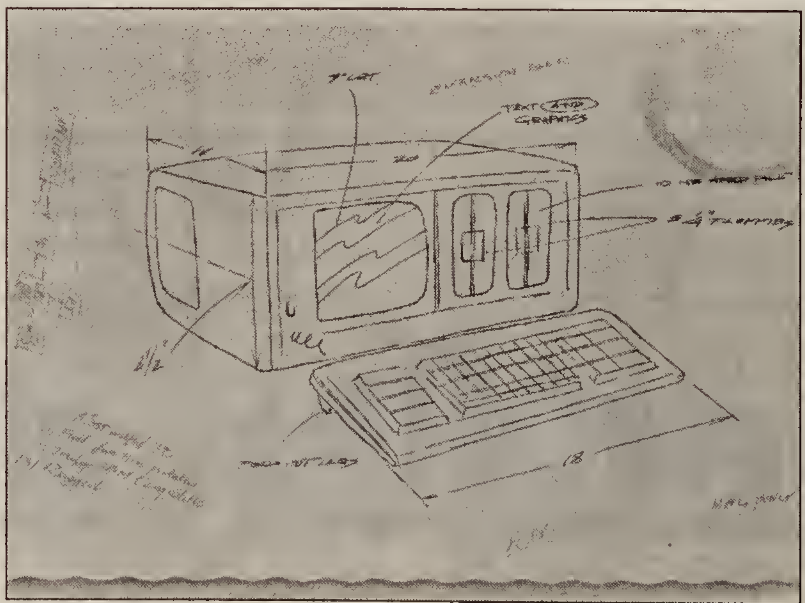
The Portable was largely responsible for making Compaq Computer Corp. the fastest growing start-up in American business. The computer was primarily responsible for the $111 million in sales during the company's first year of operation. It expired after an extended illness that was brought on by lack of sales.

The Portable was conceived on a place mat at Marie Callendar's pie house in Houston by Rod Canion (who had Boston cream pie and coffee), Jim Harris and Bill Murto, Compaq's three cofounders.

It actually came into the world, however, at the posh Helmsley Palace hotel in New York on Nov. 4, 1982. The system weighed in at a healthy — some say too healthy — 28 lbs and had a 9-in. screen, an Intel Corp. 8088 processor, 128K bytes of random-access memory and 320K bytes of floppy-disk storage. Cost of the delivery to users was $2,995.

Despite its weight problem, the Portable became extremely popular in the upper echelons of the computing community because it was able to run, without modification, all IBM PC-compatible programs, such as Visicalc, the leading spreadsheet of its day. Visicalc passed away last year.

Among the Portable Computer's more charming qualities were its Intel 8087 math coprocessor, which gave it an uncanny way with numbers, and three PC-compatible expansion slots, which provided it with more memory and other desired abilities than are usually found in desktop systems.



The Compaq Portable *as sketched at Marie's pie house*

The Portable came from a wealthy background. The plump system had $10 million in venture capital funding from a variety of investors, most notably Sevin Rosen Partners, Inc. At the time, this $10 million backing was a record in microcomputing history for a start-up.

At a ceremony here last week celebrating the birth of its grandson, the Portable 386, Ben Rosen, Compaq's chairman of the board, eulogized the late system. Rosen cited not only the system's invaluable contribution to Compaq's early success but its ability to build "hundreds of thousands of triceps and deltoids," referring to the late system's rather porcine profile.

The company said those who want to make contributions to the Portable's surviving family can do so through the Fight the PS/2 Defense Fund, whose headquarters are located in Houston.

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   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
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   - 75. User: Other ____________
   - 95. Vendor: Other ____________ (Please specify)

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   - 23. Dir., Mgr , Suprv., Analyst, of Systems
   - 31. Dir., Mgr., Supvr., of Programming
   - 32. Programmer, Methods Analyst
   - 35. Dir., Mgr., Supvr., OA/WP
   - 38. Data Comm. Network/Systems Mgt

   OTHER COMPANY MANAGEMENT
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   - 12 Vice President, Asst. VP
   - 13. Treasurer, Controller, Financial Officer
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   - 51 Sales/Mktg. Mgt.

   OTHER PROFESSIONALS
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   - 80 Educator, Journalists, Librarians, Students
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Netview revue steals TCA show

BY KATHY CHIN LEONG
CW STAFF

SAN DIEGO — Under a carefully orchestrated networking plan that involved 10 communications vendors, IBM clearly dominated the recent Tele-Communications Association show with Netview, its Systems Network Architecture (SNA) network management tool.

The move represents IBM's rapid acceptance in the vendor community, which had shut IBM out until a year ago, when Netview shipped. Not only did vendor participation in the demonstration boost IBM's presence, but the communications suppliers drew even more kudos from observers. "Users who haven't even purchased Netview yet are telling us that they will be looking for Netview-compatible products in the future," stressed Katherine Korostoff, an analyst at International Data Corp., a Framingham, Mass.-based research firm.

A spokesman for Stratacom, Inc. said his company's participation in the IBM event was spurred by user demands. "Customers we are talking to are telling us that we need to offer Netview compatibility," he said. "It's becoming a growing prerequisite."

The Netview software, consisting of Netview on the IBM host and Netview/PC for personal computers, serves as the essential building block for future IBM network management products.

Live demonstration

During the show, 10 vendors, including Stratacom, Network Equipment Technologies Corp., DCA/Cohesive, Racal-Milgo, Inc. and Timeplex, Inc., participated in a floor demonstration that linked their data networks to an IBM host based at an IBM facility in Raleigh, N.C.

The purpose of the exercise was to tout IBM's concept of Open Network Management architecture. Some observers said they found it ironic that IBM would call its plan "open" when Netview's main purpose is to manage SNA networks.

In addition, IBM opened up only three of its 15 Netview features. While vendors were proud of the demonstration, many expressed concern that applications using Netview/PC were not as robust as they would like. For instance, non-SNA networks can send alerts to Netview but cannot receive information from the mainframe to help correct network problems.

The suppliers in the demonstration pledged commitment to Netview/PC compatibility. To prove their loyalty, they previewed active screens of IBM's own SNA network using Netview/PC in their own booths.

Even vendors not in the demonstration, such as AT&T, MCI Communications Corp. and Data Switch Corp., showcased Netview compatibility with their respective software offerings, validating IBM's overwhelming presence in the network management arena.

Unlike other suppliers that had used IBM-sanctioned network management interfaces on Netview/PC, AT&T went off the beaten path. AT&T's new Accumaster Consolidated workstation will reportedly allow users to monitor Netview on the host via PC terminal emulation. "We find that using Netview/PC would be too limiting for some applications," said William Gilbert, AT&T's division manager of business markets.

Using IBM's recommended Application Programming Interface, MCI demonstrated an interface that will reportedly enable private voice network users to monitor their MCI lines on Netview/PC next year. The product, which will star in a new family of network management gear, according to officials, has yet to be named.

Data Switch will reportedly soon ship its Netview/PC Interface that will keep tabs on the Data Switch proprietary Intellinet data network.

NET ramps up T1 scope

Software update, net management tool debut

SAN DIEGO — Subtle yet significant changes in gear from Network Equipment Technologies Corp. (NET) are expected to expand the company's turf in the domestic and international T1 multiplexing markets.

After a one-year intense development effort, NET announced at the Tele-Communications Association show here last week a new software release and add-in boards for its Integrated Digital Network Exchange (IDNX) family that were designed to give significant power to users of the largest T1 networks.

In accordance with the network management theme at the conference, NET also introduced its second network management product, Integrated Network Communication System (INCS)/700.

After months of waiting, the company is assuring users that Release 7 software will be shipped with all IDNX switches. The release gives NET the ability to download software enhancements directly to customers' IDNX nodes.

Instead of being limited to 32 IDNX nodes, users can now expand their networks to 250 nodes. Each node can handle 1,024 active calls instead of 512 and support 96 trunk modules instead of 64.

More important, noted Mark Juliano, product manager for the IDNX group, are the add-in cards that will give NET an edge in the international market. A CEPT Trunk card will support the Conference of European Postal and Telecommunications, or CEPT, international T1 standard for 2.048M bits.

A CCITT Adaptive Differential Pulse Code Modulation card will support the CCITT standard for voice compression. Before this, NET supported its proprietary voice compression technique. NET is also offering an Integrated Services Digital Network Primary Rate Module.

During the conference, NET also demonstrated the INCS/700, a network management system identical to the INCS/500 except for the hardware. Considered a more powerful package than its predecessor, the 700 is based on a Sun Microsystems, Inc. Sun-3/260, a workstation that touts speeds of 4 million instructions per second (MIPS), a 25-MHz clock speed and up to 32M bytes of memory.

The INCS/500 is based on the Sun-3/160, a 2-MIPS machine that supports a 16.67-MHz clock speed with up to 16M bytes of memory. The INCS/700, priced at $130,000, is scheduled to ship in December.

KATHY CHIN LEONG

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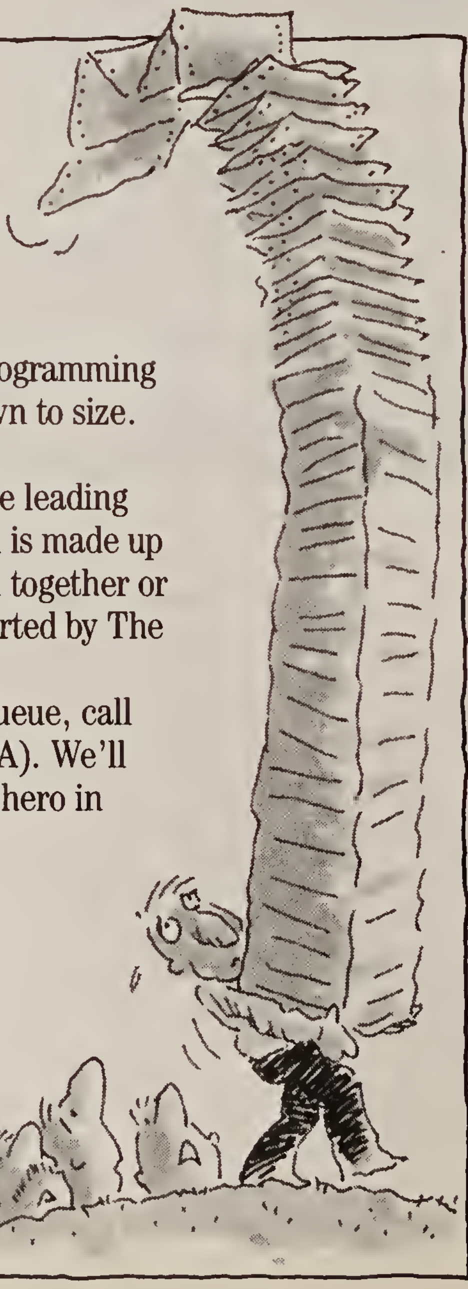

AT&T christens trans-Pacific digital service over fiber net

SAN DIEGO — In a move that signaled good news for global network users, AT&T last week announced its first digital services over the new U.S.-to-Japan 7,175-mile fiber-optic cable.

During the Tele-Communications Association show recently held here, AT&T revealed that five corporations have already pledged solid intentions to sign up for the Japan International Accunet Digital Service when it becomes available in February 1989.

These users include American Airlines in Dallas; Garban Computer Systems, Inc. in New York; J. P. Morgan, Inc. in New York; PARS Service Partnership in Kansas City, Mo.; and Normura Securities International, based in Tokyo.

Offering the service in cooperation with the Japanese carrier Kokusai Denshin Denwa Co., AT&T will sell the Pacific services at speeds ranging from 56K bit/sec., starting at $4,000 a month, to 2M bit/sec., priced at $52,000 a month. Customers will be able to sign up for three- or five-year leases.

Under the initial plan, gateways in San Francisco, Los Angeles, Washington, D.C. and New York will be made available for fiber-network access. Additional gateways to Japan will be created as the need arises, according to Rod Sturm, AT&T's director of international marketing.

The hard way?

Under current procedures, users who want to send data or voice to Japan must use satellite services or request digital services on the existing underground coaxial cable.

Users such as American Airlines said they view the fiber link as an opportunity to give their customers better service over their competitors.

According to Bill Jewell, American Airlines' director of communications engineering, the company expects to sign a five-year contract for the 56K bit/sec. service. American's preliminary plans call for linking the airline's Sabre reservation network to travel agencies and airports in Japan.

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Unisys lays out software integration strategy

BY ALAN ALPER
CW STAFF

NEW YORK — Unisys Corp. last week laid out a three-year plan to gradually integrate office automation products developed by its two formerly independent entities, Sperry Corp. and Burroughs Corp.

Under the three-tiered strategy, Unisys will provide a common user interface and definition for existing BTOS, OMS II, Sperrylink and Unix OS-based office systems.

All office products will be marketed under the OFIS Ensemble banner and will adhere to CCITT document interchange standard X.400 and IBM's Distributed Office Support System as well as System Network Architecture Distribution Systems, an IBM facility for multivendor environments.

As new system services emerge during the next three years, Unisys said, it will provide tools to enable customers to seamlessly integrate the various architectures.

"Next year, you will see interfaces across product families so that each box can talk to one another, such as a [Burroughs] BTOS system talking to a [Sperry] 1100," noted Jean Francois Guilleux, program marketing manager of office systems.

As the first step in the integration process, Unisys last week disclosed the immediate availability of E-mail interfaces between two Sperry office automation systems, OFIS Link (formerly known as Sperrylink) and OFIS Manager Unix and one between two Burroughs office automation systems, OFIS Link (formerly OMS II) and OFIS Manager BTOS.

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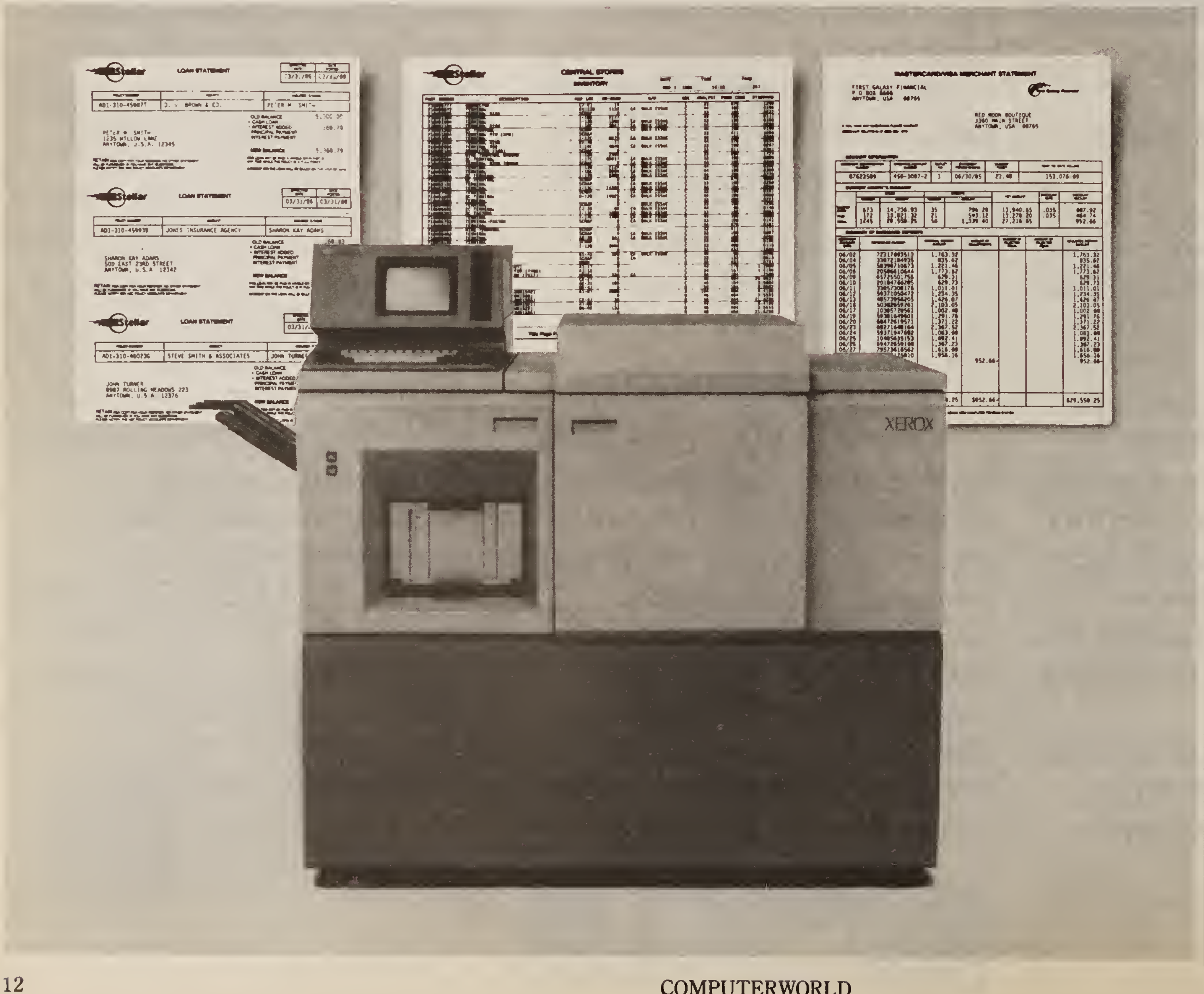

Topview clone runs 386 PCs

BY ED SCANNELL
CW STAFF

NEW YORK — Profit Technology, Inc. is expected to announce this week a series of systems, including two Intel Corp. 80386-based systems that have built-in 5¼- and 3½-in disk drives and software that offers multitasking capabilities.

The Professional System/One systems have a smart dual-speed capability that allows users to switch between the 5¼- and 3½-in. drives. The systems also come bundled with Breakthrough Mentor, which includes Proview, an IBM Topview clone that has real-time multitasking capabilities.

All members of the Professional family are compatible with the IBM Personal Computer AT and Personal System/2 lines. However, the systems use the industry-standard 16-bit bus and are not compatible with the Micro Channel architecture used in the PS/2. "We stuck with the 16-bit architecture because of the peripheral question," said Mike Cipriano, chief designer of the Professional One/System. "We feel there is a lot of support out there for that [16-bit] bus and very little yet for the IBM bus."

The Models 75 and 85 contain the 80386 processor, while the Models 45, 55 and 65 are based on the 80286. The systems cost about 10% less than comparable models in IBM's PS/2 line, a spokesman said.

Profit Technology's Breakthrough Mentor software provides users with multitasking capabilities, including the ability to display multiple programs onscreen simultaneously. Profit Technology licensed the technology for Proview from Dynamical Systems, Inc., developer of Mondrian, another Topview clone, before Microsoft Corp. acquired Dynamical and the rights to Mondrian in 1985.

"When you bring up Proview, it looks exactly like Topview. The difference is it takes up much less memory and is a lot faster [than Topview]," Cipriano said.

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'Connectivity' is the word at federal conference

Teradata-to-VAX announcement is just one attempt to get multivendor equipment together

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Vendors at the Federal Computer Conference last week trotted out a variety of products and alliances designed to help government MIS managers provide connectivity among multivendor computer systems.

The connectivity problem is especially acute for federal users because the Competition in Contracting Act and federal procurement regulations generally forbid agencies from specifying a particular hardware vendor. The requirement for competitive procurements leads agencies to try connecting systems from a wide variety of vendors.

"Multivendor interconnectivity is the No. 1 issue for federal users," says Carol Bartz, president of Sun Microsystems Federal, Inc. in Mountain View, Calif. This, she says, goes a long way toward explaining why portable versions of the Unix operating system and open systems architectures are popular concepts in the government.

Teradata Corp., a Los Angeles vendor of data base machines, announced its first link to Digital Equipment Corp.'s VAX systems. Teradata unveiled a version of its host software called the VAX Interface, which provides direct access from VAXs to Teradata's DBC/1012 Data Base Computer System via an Ethernet local-area network.

The VAX Interface, scheduled to be available in December, costs $10,000 for the VAX 8000 series and $4,000 for all other VAX systems.

Connecting the dots

Other connectivity news at the Federal Computer Conference included the following announcements:

- Apollo Computer, Inc. and Convex Computer Corp. announced a joint marketing agreement under which Apollo's Network Computing System (NCS) will be used to integrate Apollo workstations with Convex supercomputers. NCS allows users to simultaneously distribute parts of a single application across an integrated, multivendor network.
- X/Open, a London-based consortium of computer vendors, reached an agreement with the U.S. government's National Bureau of Standards to cooperate in developing specifications that improve the portability of applications software using nonproprietary industry standards. Several federal agencies plan to incorporate X/Open's portability guide in their requests for contractor bids, according to Robert R. Ackerman Jr., X/Open's chief marketing officer.
- The Wollongong Group, Inc. in Palo Alto, Calif., introduced communications software, Wollongong Integrated Networking Solutions/Streams. The software combines support for Transmission Control Protocol/Internet Protocol (TCP/IP) with Streams, the framework for implementing network protocols developed by AT&T as part of its Unix System V, Release 3.

In addition, Wollongong demonstrated a migration path from TCP/IP to the International Standards Organization's Open Systems Interconnect model.

What's the Score in Data Path Management?

	Data Switch	Other
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2 Can the vendor provide a central, multi-user control system that manages *all* the data paths in your network?	Yes	
3 In computer switching, does the vendor offer a *choice* between a single crosspoint module (1x1) architecture and a full-featured switch including test I/O, channel activity monitoring, and integrated channel extension?	Yes	
4 How many switching systems has the vendor installed?	4,500+	
5 Does the vendor provide a full range of fiber-optic channel extension systems that separate computers and control units at distances from 2 to over 60 miles?	Yes	
6 Can the vendor deliver a *proven* distributed communications matrix switch that offers a fully operational non-blocked 2,048-port capability with integrated performance monitoring—*and back up its claims with over 200 units shipped?*	Yes	
7 Are manual patching and switching products also available for smaller applications?	Yes	
8 Is the vendor able to offer an *affordable*, industry-accepted network performance monitoring system that provides extensive performance, utilization, and availability information for *all* levels of your network, including up to 255 software applications and sub-applications?	Yes	
9 How large is the vendor's own nationwide service organization?	75	
10 Does the vendor offer remote diagnostic centers in the United States and Europe?	Yes	

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Lotus bolsters 1-2-3 as rivalry mounts

Faster recalculation, simplified macro writing among firm's claims

BY ALAN J. RYAN
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. donned its boxing gloves last week against competing spreadsheets by announcing Speedup and Learn, two add-in products that increase the functionality of its flagship, 1-2-3.

The add-ins are "a good idea. I'm just surprised it's taken them so long to get them into 1-2-3," said Charles Davies, an executive director of development at General American Life Insurance Co. in St. Louis.

Speedup reportedly allows users to select a faster recalculation mode that makes 1-2-3 a more efficient calculation tool. Similarly, the Quattro spreadsheet, introduced last week by Borland International, also boasts quicker recalculation speeds [CW, Sept. 28]. Both the Lotus and Borland products allow the recalculation only of cells whose values have changed since the last recalculation.

Learn provides an automatic keystroke recorder that is said to make writing 1-2-3 macros easier. Learn also works with 1-2-3 Release 2.0.

Analyst David Readerman of Smith Barney, Harris Upham & Co. said that while Lotus was "obviously timing the introductions to the pending Microsoft Corp. Excel announcement," the enhancements were a necessary step for Lotus to keep 1-2-3 competitive with other products on the market.

"They're looking at Microsoft and what Microsoft is doing in the applications area," Readerman added.

"Other products have these capabilities, so I view them as a patch for 1-2-3," analyst Rick Sherlund of Goldman, Sachs & Co. said.

"I'm not sure what percentage of the market is going to run out and take advantage of the add-ins. But power users in particular would be interested in the Speedup feature," Sherlund added.

Free enhancements

"Our intention is to make these new enhancements that don't cost the registered 2.01 user anything," Lotus spokesman Philip Greenough said. However, the software giant said it will levy a $20 fee for shipping and handling the software and documentation.

Both enhancements are also available through the World of Lotus file on the Compuserve service, although documentation still must be obtained by contacting Lotus. Speedup and Learn are not copy protected.

Sherlund said the fact that Lotus is providing the enhancements at no charge is interesting. "It reflects a responsive attitude on the part of Lotus to nurture good will from the installed base," he said.

To install Speedup and Learn, the user is given the Add-in Manager, which permanently attaches the programs to 1-2-3 through a short series of commands, according to a Lotus spokeswoman.

Both add-ins run on the IBM Personal Computer, PC XT, AT, Personal System/2 and 1-2-3 certified compatibles. The programs are available in both 5¼-in. and 3½-in. media.

Lotus also announced last week it will boost the price of Lotus Express, personal computer communications for MCI Mail, from $100 to $150 on Nov. 1.

Hitachi counters 9370 push, adds to departmental line

TOKYO — Hitachi Ltd. last week responded to IBM's 9370 departmental systems offensive by introducing two additions to its M-600 series of mainframe-oriented products.

With the introduction of the M-630 and M-640 series, Hitachi became the second major Japanese vendor in the past month to counter the 9370, which IBM began delivering in July. Toshiba Corp. recently announced its V-7000 series.

Hitachi said the M-630 and M-640 will be shipped in Japan beginning this month. The systems will also be exported, the firm said, although no time frame has been set.

According to Hitachi officials, the M-630 also competes with IBM's System/38, and the M-640 competes with some members of the IBM 4381 family.

The M-630 and M-640 feature Hitachi's distributed department computer connection and a new operating system, Hitachi VOS1/ES2. VOS1/ES2 was designed to be compatible with existing Hitachi software and to run IBM applications.

Hitachi introduced four models in each series. The M-630 Model 10 and M-630 Model 20 support 8M to 32M bytes of memory, while the M-630 Model 30 and M-630 Model 40 are available with 16M to 64M bytes of memory.

The M-640 Models 10, 20 and 30 have 32M to 128M bytes of memory, and the M-640 Model 40 supports 32M to 128M bytes of memory.

Monthly lease prices for the M-630 series start at $8,280. Lease prices for the M-640 range from $31,724 to $82,759 per month. VOS1/ES2 can be leased for $2,759 a month.

Alloy links net to Macintosh

BY PATRICIA KEEFE
CW STAFF

FRAMINGHAM, Mass. — Alloy Computer Products, Inc. last week jumped on the Macintosh bandwagon, announcing software said to open up its PC-Plus network to the Apple Computer, Inc. product.

Link-Mac, set to be available Nov. 1 at a retail price of $195, will be integrated into the Macintosh's icon-oriented menu, providing compatibility with the micro's standard menu operation, including mouse selection of functions and pull-down menus, the company said.

File transfer capabilities between the Macintosh and the PC-Plus shared disk drives will be supported in both directions, according to Alloy.

Link-Mac is loaded into a Macintosh, which acts as a terminal on a Microsoft Corp. MS-DOS-compatible Alloy network, giving the Mac full access to all IBM Personal Computer functions, including 3278 emulation.

Macintosh users will be able to exchange ASCII files with MS-DOS users, said Dave Friesen, Alloy's director of strategic marketing. Alloy is currently testing products such as Microsoft Word that run on both Macintosh and DOS computers for compatibility problems.

Friesen said the company anticipates the product will appeal primarily to existing Macintosh users who have an occasional need to use MS-DOS applications. Link-Mac users connected to PC-Plus will also gain a gateway to the IBM mainframe, Alloy claimed. The vendor recently shipped Mainline, its mainframe gateway product.

Access to Token-Ring networks will be possible once Alloy releases a bridge product linking PC-Plus to IBM's Token-Ring or compatible networks late in the fourth quarter, Friesen said. A similar bridge for Ethernet networks is slated for delivery early next year, he added.

Later this year, Alloy plans to provide the ability to connect PC-Plus directly to Digital Equipment Corp.'s VAX environment.

Link-Mac consists of three diskettes: a 3½-in. Mac formatted diskette, a 3½-in. IBM formatted diskette and an IBM Personal System/2-compatible diskette. It also contains a cable that converts data from the Macintosh's DIN RS-422 interface to IBM's DB9 RS-232.

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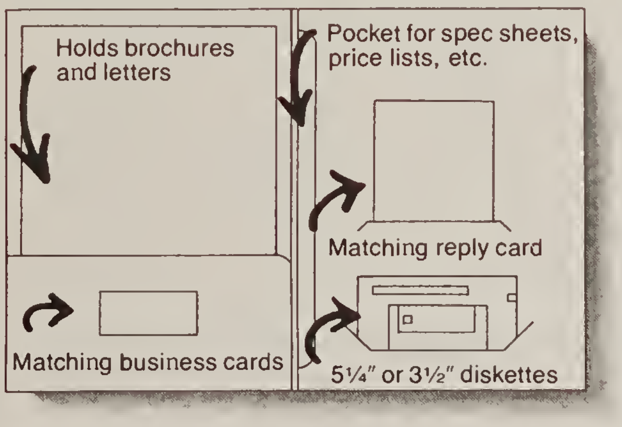
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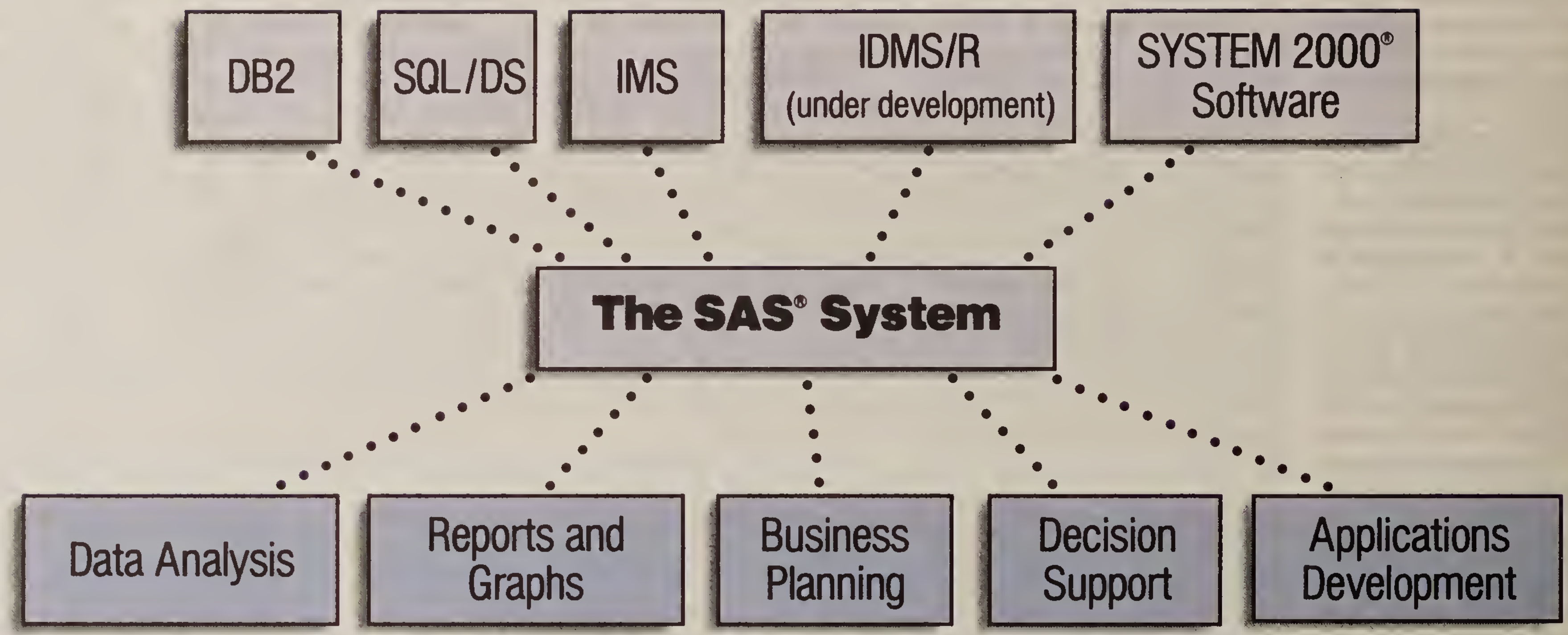

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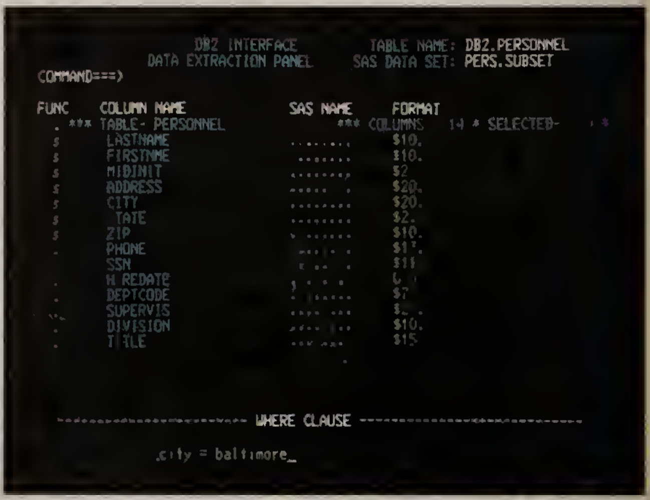

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              DATA EXTRACTION PANEL    SAS DATA SET: PERS.SUBSET
COMMAND===>

FUNC   COLUMN NAME              SAS NAME     FORMAT
  .  *** TABLE- PERSONNEL            *** COLUMNS   14 * SELECTED-
  s      LASTNAME               .........    $10.
  s      FIRSTNME               ........     $10.
  s      MIDINIT                .........    $2
  s      ADDRESS                ......   .   $20.
  s      CITY                   .........    $20.
  s      STATE                  .........    $2.
  s      ZIP                    .........    $10.
  .      PHONE                                $1[illegible]
         SSN                                  $11
  .      HIREDATE                             [illegible]
  .      DEPTCODE                             $7
         SUPERVIS                             $[illegible]
  .      DIVISION                             $10.
  .      TITLE                                $15

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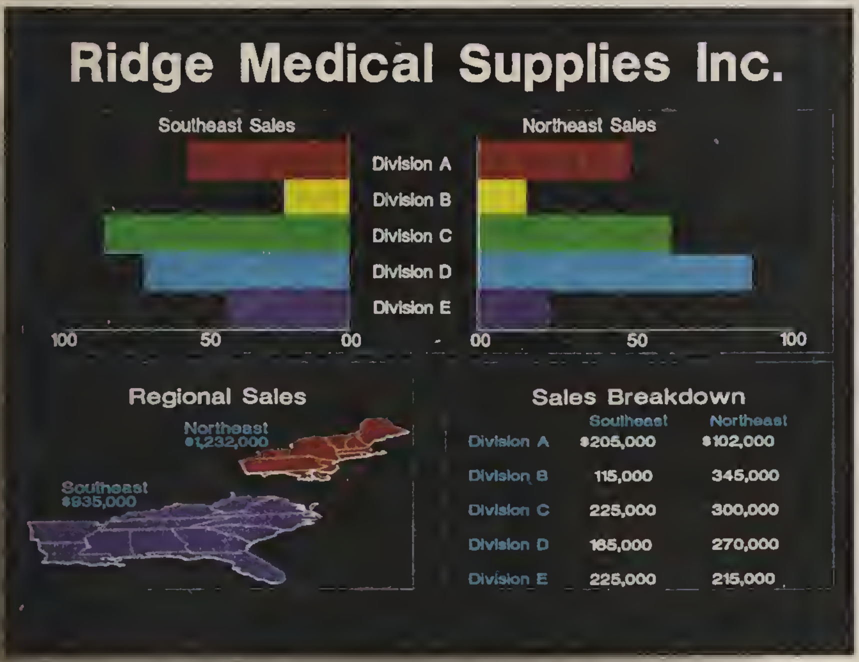
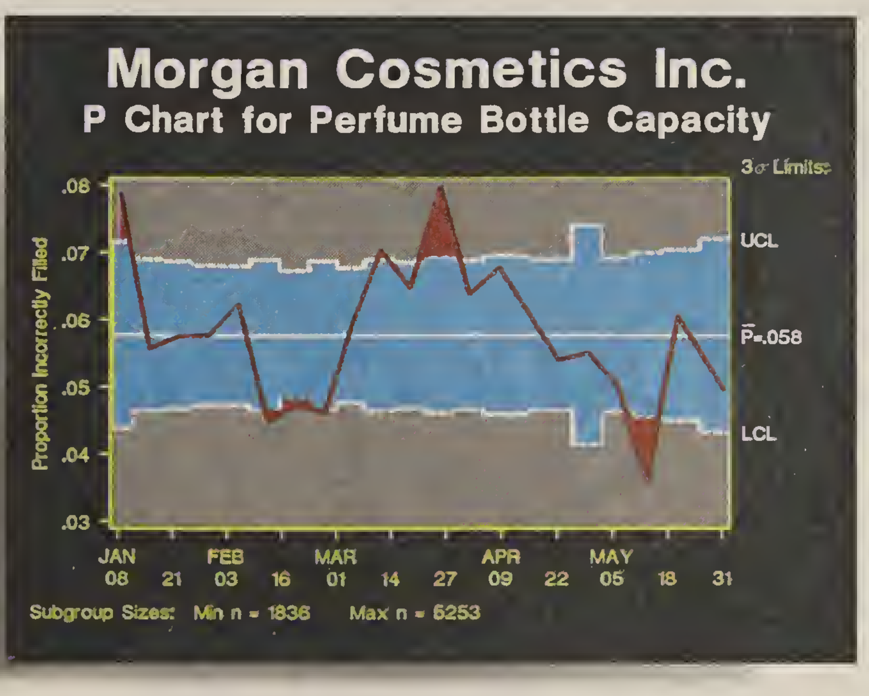
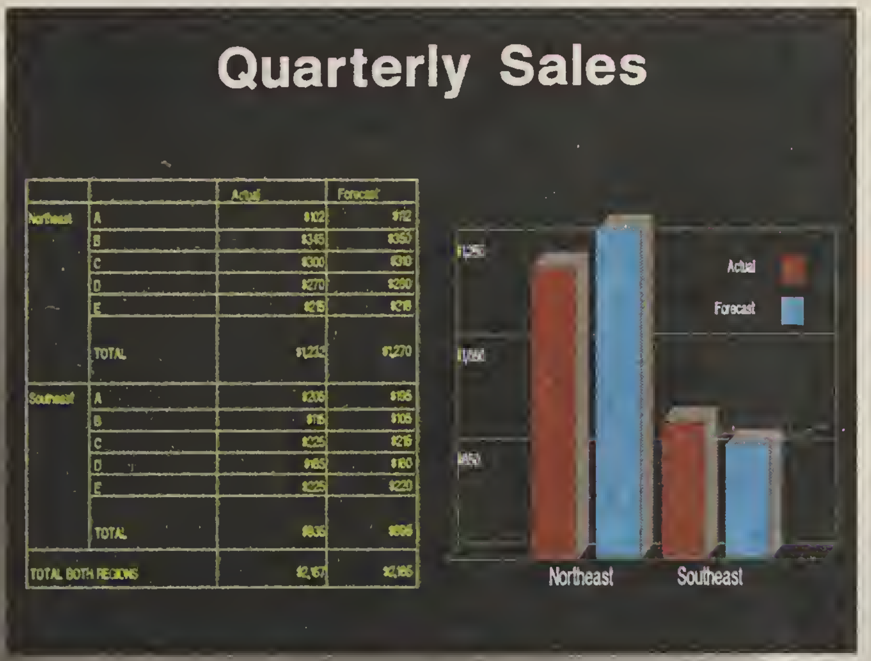


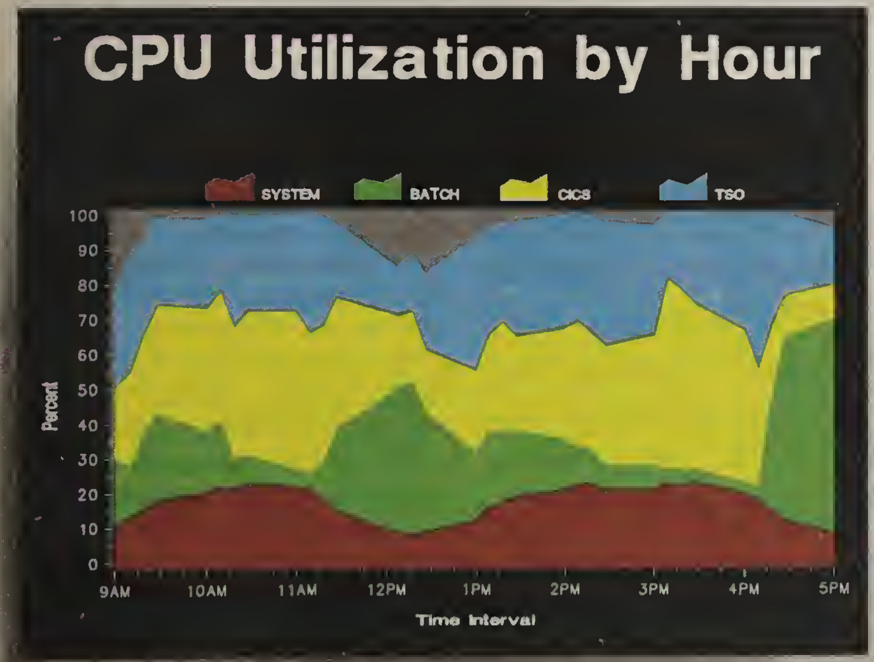
Sales Breakdown

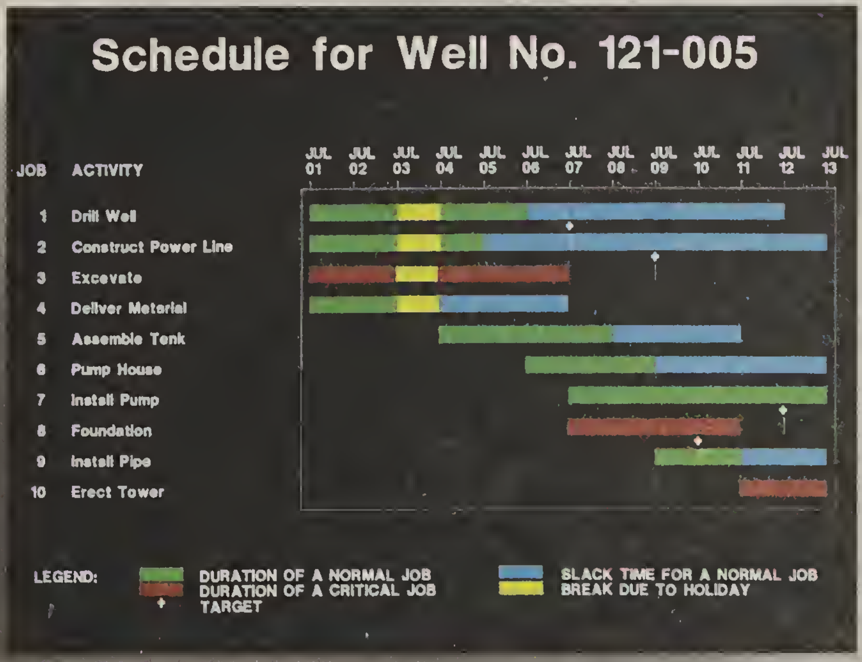
	Southeast	Northeast
Division A	$205,000	$102,000
Division B	115,000	345,000
Division C	225,000	300,000
Division D	165,000	270,000
Division E	225,000	215,000





		Actual	Forecast
Northeast	A	$102	$112
	B	$345	$350
	C	$300	$310
	D	$270	$280
	E	$215	$218
	TOTAL	$1,232	$1,270
Southeast	A	$205	$195
	B	$115	$105
	C	$225	$215
	D	$165	$160
	E	$225	$220
	TOTAL	$935	$895
TOTAL BOTH REGIONS		$2,167	$2,165





JOB	ACTIVITY
1	Drill Well
2	Construct Power Line
3	Excavate
4	Deliver Material
5	Assemble Tank
6	Pump House
7	Install Pump
8	Foundation
9	Install Pipe
10	Erect Tower

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Oracle to battle DB2 with speedier DBMS

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Oracle Corp., preparing for head-to-head competition with IBM's DB2, will unleash a high-powered version of its relational data base management system next year that is souped up for on-line transaction processing, Oracle's president informed customers last week.

Lawrence J. Ellison, president and chief executive officer of the Belmont, Calif.-based DBMS vendor, sketched out the product plans during the 10th annual Oracle International Users Conference, which was held here.

Specifically, he said Oracle has developed Version 6 of its flagship Oracle relational DBMS with a Transaction Processing Subsystem (TPS) that is at least twice as fast as competing products, including Sybase, Inc.'s DBMS and DB2, in competitive benchmarks.

"It sounds great. It's exactly what we're looking for," said Richard Tuey, director of MIS planning and evaluation for the U.S. Department of Health and Human Services.

Tuey said that the department is planning an in-house travel service on an IBM 3090 that features heavy transaction processing requirements.

Ellison claimed the product, set to be available next spring or summer, has enhancements designed for transaction processing, interactive computing, fault tolerance and parallel processing.

Breakthrough claimed

The DBMS functions and speed are a "major technological breakthrough," resulting from a very difficult, 30-month development effort, Ellison said.

Not only is the new product faster than DB2, it also is portable among a variety of hardware systems, he emphasized.

With DB2, users are married to IBM and the MVS operating system for the life of the application, Ellison said.

The Oracle DBMS is offered on IBM mainframes, a variety of minicomputers, including Digital Equipment Corp. VAXs, and IBM Personal Computers.

Furthermore, Ellison said, benchmarks showed that when hardware processing power is doubled, for example, the Oracle software's transaction processing rate doubled, too.

Ellison's presentation to users was off-limits to the press, but he described the product strategy later at a conference luncheon.

He acknowledged that while Oracle is competing with IBM, it sometimes must coexist with DB2 when clients insist on selecting DB2 for IBM mainframes.

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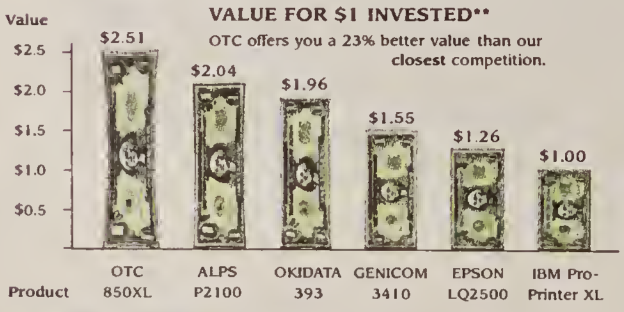

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Oracle enters CASE market

BY ALAN ALPER
CW STAFF

NEW YORK — Oracle Corp. recently began marketing a set of computer-aided software engineering (CASE) tools in the U.S. for designing Oracle SQL-compatible relational data base management systems.

Oracle's approach, called the SQL Development Method, is based on entity-relationship analysis and a data dictionary — the SQL Design dictionary — that automates the design, development and documentation of new applications and provides a vehicle for maintaining existing ones. It was devised and has been used by Oracle's UK subsidiary for the past three years.

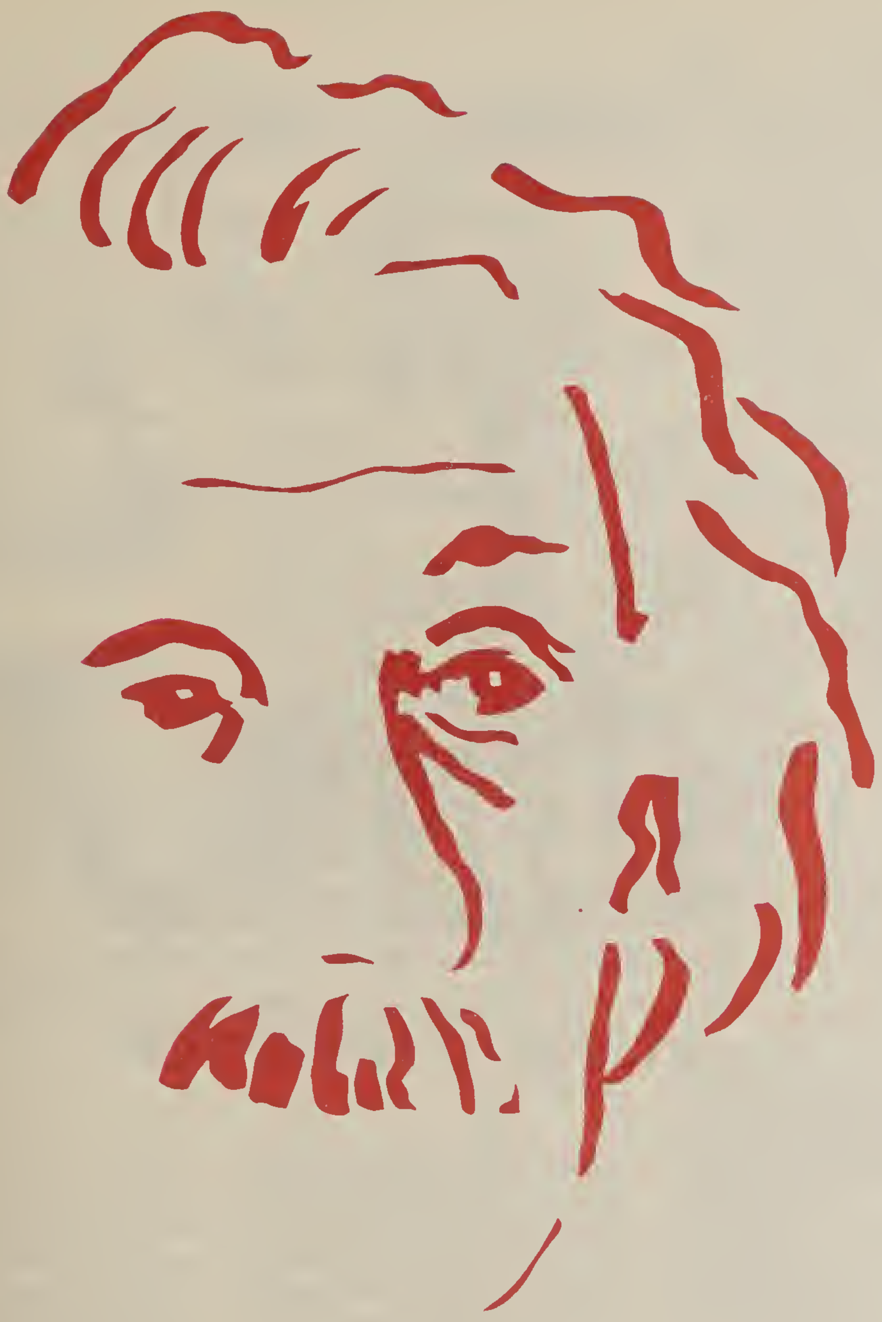
"This is Oracle's way of saying that it's not content to just sell programming tools but will help implement a business's data base system," noted Michael Lynott, a senior consultant at Oracle's Iselin, N.J., office.

The data dictionary, a set of tools and reports, is used to document and control all phases of the development life cycle from requirements definition through documentation and maintenance. The entire data base definition command set is generated in SQL, the company said. More than 50 reports are provided to document the design at various levels of detail.

The method's greatest value may come with maintaining and changing existing applications, Oracle said, since initial development of business systems compose only 30% of overall life cycle costs. "You need to get it right before you commit to code; it will prove very costly later on if you haven't," Lynott said.

In its initial version, Oracle's methodology does not offer any graphics capability to depict data flow through the system or for screen painting, facilities considered part and parcel of CASE technology.

The CASE tool is being offered by Oracle's consulting arm and is being sold by its sales force directly to end users, Lynott said. The SQL Design Dictionary is currently available on Digital Equipment Corp. VAX/VMS systems and lists for between several hundred dollars and $15,000, depending on processor size. The firm said it expects to offer a version for IBM-compatible personal computers soon that will be licensed for $2,000.



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EDITORIAL

Tell me a secret

By submitting to binding arbitration in its dispute with Fujitsu, IBM has unleashed a demon that it would just as soon have kept in the closet.

IBM must now deal with the fact that a foreign competitor has been given access to trade secrets that its American competitors have sought for years. It is time for IBM to confront this issue directly.

Source code access goes to the very heart of a debate that has dominated the independent software industry since 1983. It was then that IBM announced the now notorious "object code only" policy. Under that campaign, IBM vowed to restrict source code on certain software products in an effort to provide "increased protection of IBM's programming investment and technology."

The Fujitsu settlement, however, has created a double standard. In response to more than four years of entreaties by ADAPSO, IBM has repeatedly stated that the object code only policy is not a negotiable issue. But the Fujitsu decision is, in effect, a negotiated settlement that permits the access that ADAPSO and others have repeatedly sought.

That contradiction prompted outgoing ADAPSO Chairman Jay Goldberg last week to blast the Fujitsu settlement. "It is unthinkable that Japanese software developers be given access to IBM operating systems' source code while American companies . . . are excluded from such access," he said.

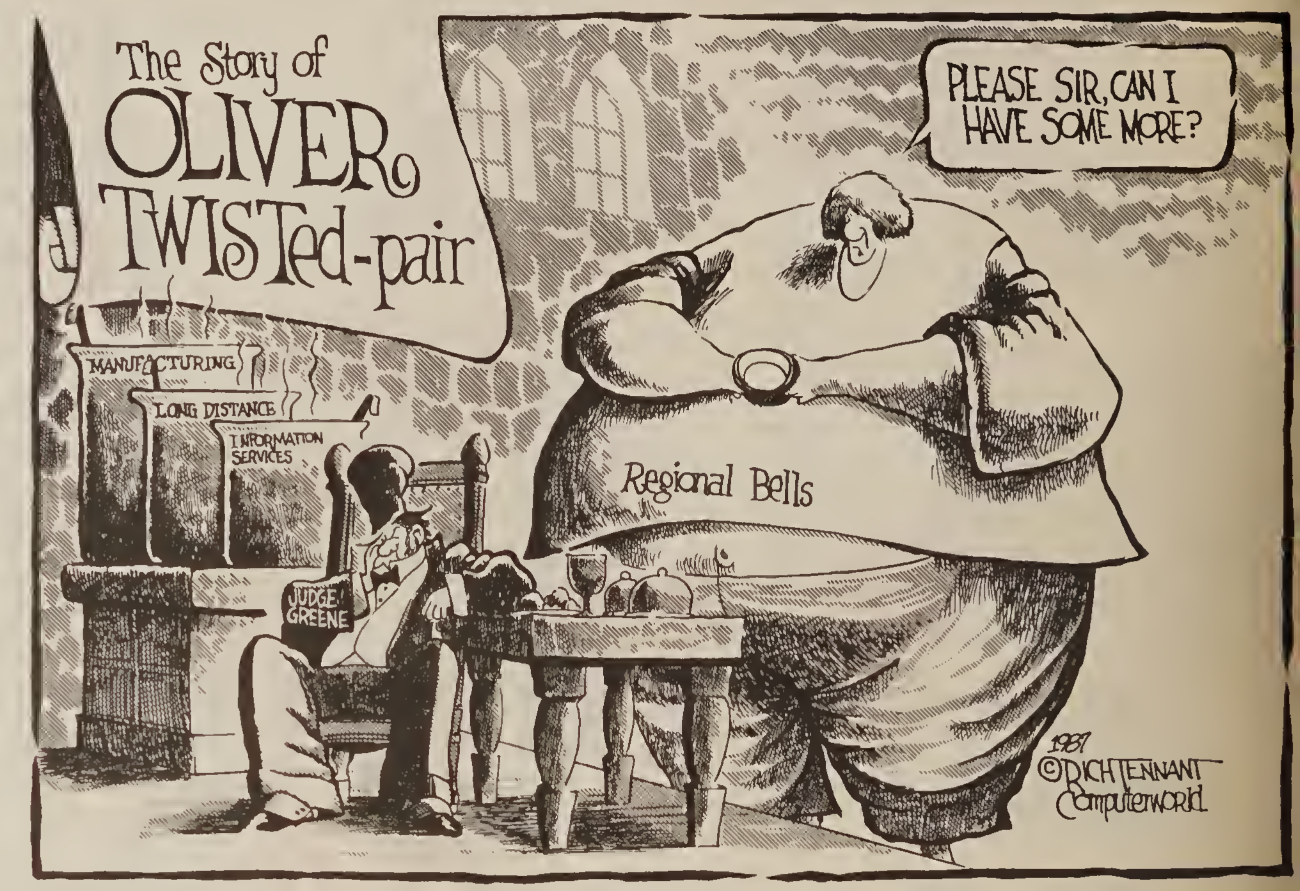
Goldberg's point is well taken. Putting aside the legalese of the arbitration agreement, the specifics about secure facilities and compensation, one immutable fact remains: IBM has agreed to reveal its software treasure trove to outsiders, and those outsiders are Japanese.

Equally important, IBM must confront the arbitrator's opinion that the settlement "will foster competition" in mainframe operating system software. Competition is always good for users. And if a Japanese firm is now entitled to the advantage it needs to provide such competition, shouldn't American companies have the same opportunity?

Few would argue with IBM's reasons for wanting to protect a source code library that represents billions of dollars of investment or with its desire to receive just compensation for granting access to it. But the arbitrator's decision has altered the facts in the case and significantly weakened IBM's defiant position on this issue.

IBM is to be commended for submitting the Fujitsu dispute to binding arbitration, thus avoiding a legal battle that would doubtless have dragged on for years. But binding arbitration is a roll of the dice. IBM was certainly aware of the potential dilemma that the decision could create.

Independent software developers are only demanding that they be allowed to negotiate the issue. It is no longer enough for IBM simply to declare that the matter is not open for discussion.



LETTERS TO THE EDITOR

1706 stranglehold

When the issue of Section 1706 "hit the fan," *Computerworld* pointed out inequities in the law and allowed both sides the chance to air their views.

But your coverage soon shifted away from reality and toward the spreading of misconceptions that were created by those who lobbied for this horrendous legislation. The final proof of this shift was "1706: Unite and move on" [CW, July 27].

Congressmen Judd Gregg (R-N.H.), Richard A. Gephardt (D-Mo.), John J. Duncan (R-Tenn.) and Brian Donnelly (D-Mass.) issued a letter to their colleagues entitled "Section 1706 is The Panacea For Big Businesses That Couldn't Compete With The Little Guy." In it they ask, "Are you aware that we adopted a provision of the 1986 Tax Reform Act that is strangling small businesses in the computer and engineering fields, and that we did so based upon claims by a few large national firms that these small businesses and independent contractors had a competitive advantage over them?"

According to an Independent Computer Consultant Association publication, "Section 1706 was promoted quietly by one trade association, the National Technical Services Association, which has only 85 member firms . . . spearheaded by a single company, CDI Corp.," which *Standard and Poor's Register* calls the "largest U.S. engineering, technical and scientific contract services organization."

According to a June 5 Data Processing Management Association (DPMA) news release, "The negative effect of Section 1706 on all business is now more apparent. DPMA had always assumed that a small portion of the computer industry was directly impacted by Section 1706. We now realize that the impact on that small group is echoing throughout many businesses and the effect is tremendous."

Clearly, 1706 is anticompetitive, negates responsible government action and is discriminatory. The cost of 1706 is high and rising daily.

Richard Kuper
RK Enterprises
Forest Hills, N.Y.

Harry A. Cozzi
Automated Software Design, Inc.
Middletown, N.J.

Our side

I want to clarify two points that readers of "IBM squeezing front-end market" [CW, Aug. 17] may have misunderstood.

NCR Comten provides value-added capabilities in addition to providing IBM-compatible features. For example, NCR Comten has offered a host-independent connection to CCITT X.25 networks for many years. IBM later announced its X.25 interface, NPSI, and NCR Comten developed another X.25 implementation that was strictly comparable to IBM's host-based NPSI. Today, NCR Comten offers both X.25 implementations.

NCR Comten also provides a host-independent connection between IBM Systems Network Architecture networks through Comten Network Gateway. Before that, IBM announced its gateway product, System Network Interconnect. Again, NCR Comten will develop an IBM-comparable gateway product and offer that in addition to the Comten Network Gateway, providing users with a choice.

A second misperception may exist in regard to NCR Comten's dynamic reconfiguration capabilities. At Interface '87, NCR Comten announced Comten Display System Manager, a product that includes on-line network configuration features. Through that product, network operators can add or change terminal destinations, password protection and application location information independent of the host and while the communications processor is on-line. The network operator can make the changes permanent by reloading the processor.

Michele Wolff
Corporate Communications
NCR Comten
St. Paul, Minn.

Bon voyage

I read the article "Play it again, MIS" [CW, Aug. 24] with special interest. I retire on Oct. 23 at age 62, after 41 years in MIS that started with IBM in 1946 and are ending after 25 years at my present firm.

It has been like a rocket ship ride as we have moved rapidly through all the evolutionary developments. I, for one, am ready to call it quits and see what the rest of the world is doing.

W. H. Munsterman
Manager of User Support Services
Salt River Project
Phoenix

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

A world confederacy of data technology

In the global village of computer users, problems and solutions stem from a single knowledge base

AMY WOHL

I have noted, in my travels, a certain paranoia among computer people — vendors, users and consultants alike. Outside the boundaries of the U.S., computer folks feel a certain uneasiness in describing their latest efforts, fearful that whatever they're doing is old hat by U.S. standards.

I have never been convinced that such fears are justified. However, a recent trip through the South Pacific (New Zealand and Australia) and the Far East (Singapore, Hong Kong and Canton), brought to mind some issues of interest to computing Americans, as well as our colleagues overseas.

> THE PC may be even more appealing abroad — where computer people and resources are rightly regarded as scarce goods to be carefully husbanded.

Computer users, more than any other citizens of the planet, live in a global village. Thanks to the modem and the telephone line, the latest news appears on all our desks nearly simultaneously.

I am not implying that each of us is already getting *Computerworld, Business Week* and *The Harvard Business Review* electronically (although that day may not be far off), but rather that, thanks to modern communications, all of these publications get and disseminate their information much more quickly today. Not only are articles, information and photographs collected electronically, they are edited and laid out electronically, and they can be electronically routed to local printing presses.

This means that I, in Bala Cynwyd, Pa., may know about a new IBM product just a few minutes before my friends in Hong Kong or Sydney. Geographic information differences need no longer be measured in days or weeks. My foreign associates recognize this change; in fact, they complain about the information explosion just as much as we do.

However, they believe U.S. users of computing technology are quicker to recognize new technologies and quicker in deciding to adopt them. They also believe we are quicker to get management approval for funding and at getting things planned and installed.

Is this belief really true? And if so, why is the U.S.'s competitive position not stronger? Or is technology not really as important as we thought?

In fact, the recognition of new technology and its swift implementation is not a wholly American trait. While U.S. businessmen are used to spending substantial portions of their budgets for hardware, software and services, so are their counterparts around the world.

Startling glimpses

At government departments and private businesses in Hong Kong and Singapore, I was startled by the amounts of computer hardware I glimpsed. Certainly, there were as many desktops adorned by personal computers in these Far Eastern offices as I would likely see in similar firms back home. In fact, because of its relatively low cost and ability to be locally selected, supported and controlled, the PC may be even more appealing abroad — where computer people and resources are rightly regarded as scarce goods to be carefully husbanded — than it is here.

PCs on their own, of course, are not nearly so useful as PCs attached to networks and systems. U.S. users seem to be moving more quickly up the interconnection ladder, perhaps because they have more networks or more confidence in their previous experience in controlling large, complex networks.

There are differences in how the value of computing is viewed from country to country, but these seem to have more to do with the culture and financial condition of the country than with its geographic location or the tastes and preferences of its nearest neighbors.

Cultural differences count for a lot. Technologies like office automation, with its democratic air of everyone doing his own work, cheerfully sending and receiving information from identi-

Continued on page 22

Wohl is president of Wohl Associates in Bala Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

Has IBM sold out its future?

The pact with Fujitsu may prove to be a wily move or a major stumble

FREDERIC WITHINGTON

IBM has agreed to make its operating systems available to Fujitsu Ltd., now and in the near future, for cash payments to be set by arbitrators. IBM previously agreed to make its operating systems available to Hitachi Ltd. also for cash.

Thus, IBM's two main plug-compatible rivals will be guaranteed the benefits of IBM's operating systems investments and innovations. (Amdahl Corp. and National Advanced Systems Corp., the two primary plug-compatible mainframe vendors in the U.S., sell Fujitsu and Hitachi products respectively.)

The agreement gives Fujitsu an unlimited hunting license in IBM's own preserve, using IBM's own ammunition.

The primary products

IBM may have made a historic mistake, selling its primary source of market strength for cash it does not need. Mainframe makers learned in the 1960s that operating systems are the primary products of the industry — harder and more costly to build than computers, and, once adopted by customers, the source of a continuing flow of hardware orders.

The "sale" of the operating system was the main objective, even if the operating system itself was free, as was the case then; customers would accrete layers of programs around the system that would preclude changing vendors without a traumatic conversion. In those days, Burroughs Corp., Sperry Corp., Honeywell, Inc. and Control Data Corp. obtained operating system customers that are still with them.

Fujitsu and Hitachi came too late to the mainframe market. By the time they could offer robust, full-featured operating systems, it was clear most of the potential customers in the U.S. and Europe had committed themselves to an existing one.

However, IBM's operating system was in the public domain; in the early 1970s anyone could copy it, modify it or use it freely.

The Japanese, incredulous that IBM would give away such a valuable product, happily adopted it and ever since have been providing their own highly cost-effective machines for IBM-committed customers.

IBM slowly corrected its error. With successive releases and the use of microcode, IBM converted the free operating systems to licensed products with substantial fees. The microcode also provided a means to shut out the plug-compatible manufacturers. IBM successfully claimed protection for its microcode as a trade secret; and as more of the operating system functions inevitably migrated to microcode, IBM had the means to force Fujitsu and Hitachi to go it alone.

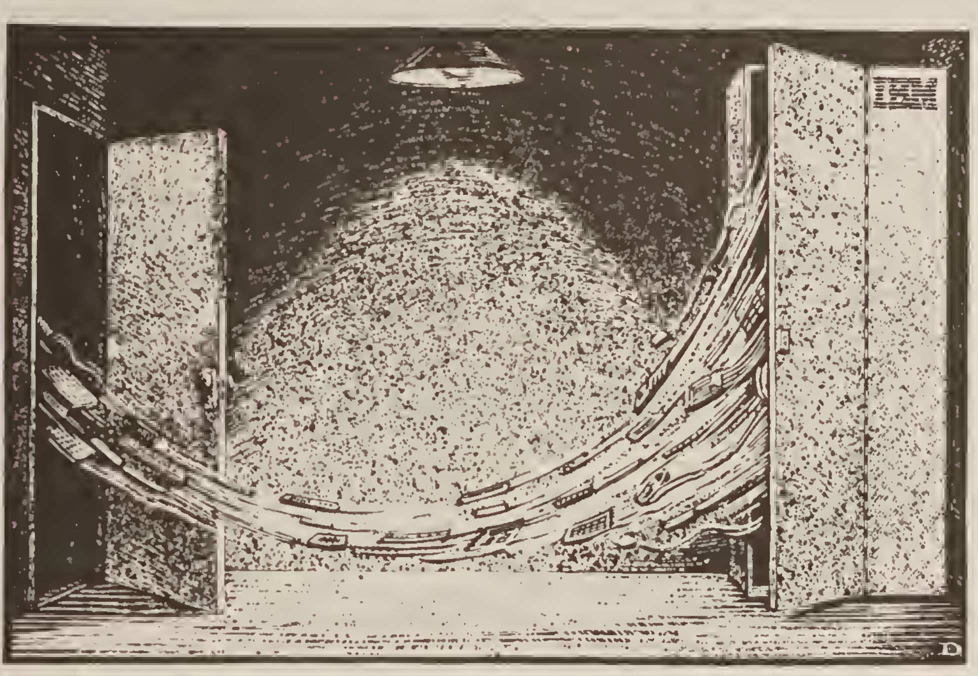
The market for minis is also dominated by operating systems, particularly VMS and Unix, which show the difference in the marketplace between proprietary and public operating systems. Digital Equipment Corp.'s VMS has never been made available to a hardware competitor (except for noncompetitive military machines); as a result, DEC dominates its market and continues to grow like a weed.

Vendors of Unix machines, in contrast, are generally hungry and slow-growing. Some machines, such as supercomputers, feature unique internal software and use Unix only for external functions.

There is no problem there, but those adopting Unix for internal system control suffer all the problems of commodity makers. Since it is easy to design a Unix machine, too many companies have done it.

Waves of clones

IBM itself got into the commodity-product trap with its Personal Computer. Having no means of restraining plug-compatible competition once its BIOS was successfully reproduced, IBM suffered the waves of cost-effective PC clones. Recently, IBM countered, with an apparent effectiveness, with the harder-to-copy PS/2 and OS/2.



BOB DAHM

So IBM apparently had the means to close competitors like Fujitsu and Hitachi out of the mainframe market, and it has shown the will to do so in the PC market.

But IBM didn't do it.

Instead, IBM has guaranteed that Fujitsu and Hitachi will be able to continue to use its software and offer plug-compatibility to its customers. The Japanese must pay undisclosed sums of money, but since the amounts are controlled by neutral arbitrators, they will be affordable.

Besides, since IBM apparently had the means of shutting the Japanese out of the plug-compatible mainframe market altogether and didn't use it, any amount the Japanese could afford might be seen as not very much.

Why did IBM agree to such an arrangement? It wasn't legally required to — DEC's successful and immensely profitable defense of VMS and the VAX architecture shows that. IBM's legal history differs from DEC's, however; perhaps among its earlier settlements and consents there are enough precedents to make its lawyers nervous.

Did IBM do it for the money? Probably not. Any revenue it will accrue won't add much to a $50 billion base, and IBM already generates as much cash as it can use.

IBM must perceive that retaining the rights to its operating systems simply isn't worth as much as it used to be, and that the revenue will be worth the lost market position.

Why would IBM conclude

Continued on page 22

A 30-year veteran of the computer industry, Withington was a vice-president of Arthur D. Little, Inc. and is now an independent consultant. He has written four books and more than 60 articles and papers.

IBM's future

CONTINUED FROM PAGE 21

that control of operating systems has a declining value? Are they going to abandon OS, for instance, for some other product? No way; if the new one should prove incompatible, customers would jump ship in droves for compatible Japanese products.

Maybe the answer is that IBM's hardware product improvements are going to be so rapid that Fujitsu and Hitachi won't be able to keep up, even with software access. We have seen IBM's position in semiconductors approaching world leadership, especially in very large memory chips. We have seen increased use of automated manufacturing and direct use of low-cost manufacturing locations like Taiwan that negate the Japanese labor cost advantage.

Maybe IBM is inviting the Japanese competitors to help expand the IBM-compatible market, with plans to take away the cream of it through a combination of license fees and product improvements that will come too fast for the Japanese to match.

If this scenario is correct, IBM will deserve credit for a brilliant competitive move: giving away assets today in order to recapture them with interest tomorrow. If not — if the Japanese competitors are able to maintain their past and present hardware strength — it will appear that IBM has made a vast mistake.

Confederacy

CONTINUED FROM PAGE 21

cal workstations, is appealing in countries like Norway and Denmark and acceptable in many places in the U.S. and Canada. It is, however, viewed much less enthusiastically by managers in places with more formal office hierarchies (and in their cultural roots), such as West Germany and France. In countries like Australia, where female secretaries are plentiful and female managers still rare, male managers look at keyboards, think "Typing!" and tune out. In Scandinavia, where the manager (or the prime minister) is often a woman, male bankers have been observed keyboarding happily.

Image seems important. Emerging and underdeveloped countries are often eager to install computers quickly and thoroughly as a sign that they have become members of the modern age. This fervor leads to interesting anomolies — and some fresh insights into the uses of technology. Recently, a manager for a major computer vendor told me the People's Republic of China is eager to consider office automation because the electronic-mail function would allow the government to quickly collect and disseminate information, an important function in a centrally planned, geographically dispersed country.

Signs of success

Spending patterns have their own culture. Some U.S. industries are big spenders. They see luxurious workplaces as proof to their customers of confidence in an ever-growing future. Such companies are quick to spend money on technology as a visible sign of success.

Outside the U.S., success is sometimes more discreet. A dusty unrenovated exterior may indicate failure, or it might bode hidden treasures inside and a fat bottom line. However, certain U.S. industries are also discreet with corporate funds and as slow as any West German banker or French shopkeeper to part with money for new computers when the old ones still work.

Also, Europeans, Asians, Australians and Canadians are no more likely or less likely than we are to be "good" or "bad" at business, and using computer technology wisely is simply another business decision. We share a common problem: understanding how to use computers in meaningful ways to assist in growing and managing successful businesses. But we need to do so while avoiding the temptation to invest unwisely in technology, to foolishly climb Mt. Everest just because it's there.

It is somehow satisfying to be far away from home and hear the same questions: How do I get management commitment for this project? Will senior managers use a system? Can secretaries transfer from dedicated word processors to PC-based systems? How do you cost-justify electronic mail? Should I buy the PS/2? . . . and to know that the answers, as well as the questions, flow from a common, worldwide store of knowledge.

This week in history

Oct. 3, 1977
The National Commission on Electronic Funds Transfer (EFT) gives the U.S. Department of the Treasury the green light to develop an EFT system through the Federal Reserve, effectively barring AT&T from competing in EFT services.

Oct. 4, 1982
The White House announces an ambitious long-term plan to fundamentally change the structure of the federal government by featuring governmentwide compatibility of all administrative computers and computer systems. White House adviser Ed Meese vows to have the government running in a "businesslike manner."

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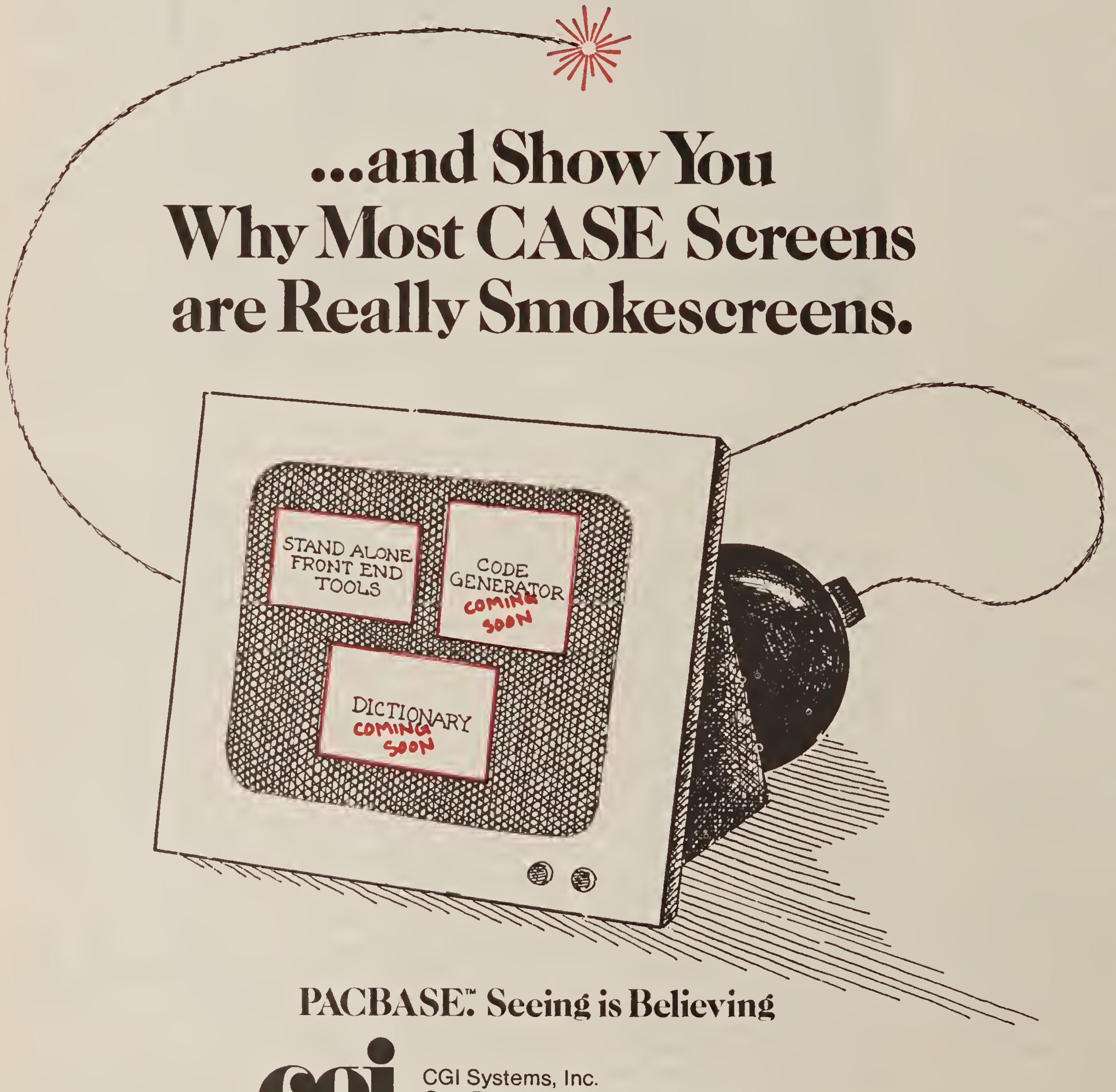

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SOME THINGS YOU CAN'T EVALUATE FROM A LIST OF INGREDIENTS. A DBMS IS ONE OF THEM.

When you think about it, relational DBMS products have a lot in common. They're all built around SQL. Most include 4GL tools. They all have a list of features and functions you can check off one at a time. And they all claim high performance.

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SOFTWARE & SERVICES

SOFT TALK

Charles Babcock

Object is DBMS focus

Although some mainframe software companies have been left behind in the rush to relational data base management systems, they will soon be launching their own relational, or at least SQL-based, products. Several are believed to be pursuing object-oriented technology that may allow them to advance the state of the art.

If companies say they are planning to leapfrog relational to object-oriented systems, don't believe it. As George Schussel, president of Digital Consulting, said recently at his firm's computer-aided software engineering conference, "If a vendor says he has a postrelational product, I would be very suspicious. That's usually an apology for not getting into SQL."

All of the mainframe software companies featured in the recent *Computerworld* restructuring series are getting into SQL. For that matter, there is nothing that precludes an object-oriented system from being relational, but so far, the companies involved have not divulged the nature of their research. The companies believed to be working on object-oriented systems include Software AG, Computer Corp. of America and Cullinet.

The reason this work may be significant is that existing DBMSs don't answer all needs.

Continued on page 30

VM update gets user put-down

Improvements to much-heralded TSAF called incomplete, insignificant

BY ROSEMARY HAMILTON
CW STAFF

Early users of IBM VM/SP Release 5 have given the new operating system a lukewarm response, claiming that it is not a major improvement over the current VM offering.

"Lots of the new stuff seems like cosmetic puffery," said Daniel Franck, a systems programmer at Mitrol, Inc., which sells software for IBM's VM operating system. "Hopefully, the more serious stuff will come later. This release seems to be introducing concepts."

Franck and other users contacted by *Computerworld* recently said there are some useful enhancements in Release 5 but that overall, it has not brought significant changes to their environment.

VM/SP Release 5 was introduced a year ago, along with the IBM 9370. It became generally available in April. The operating system featured a number of new functions, including windowing and the much-talked-about Transparent Services Access Facility (TSAF), which is the basis for VM program-to-VM program communications.

No support, no interest

Some early users said TSAF and other features are either incomplete or do not apply to their environment. "TSAF sounds really neat, but without full LU6.2 support, then we're not really interested," Franck said.

James Buba, a VM systems programmer at the Whippany, N.J.-based National Exchange Carriers Association, a Federal Communications Commission organization that administrates long-line usage, also expressed a lack of interest in TSAF. "When they start really enhancing it, I think interest will explode," he said. "But it doesn't really apply to what we do, so I don't think we'll make use of it."

Analog Devices, Inc. in Norwood, Mass., recently installed Release 5 but not because it would provide great performance improvements. According to Luke Marvin, manager of systems software, Analog moves to a new release when it becomes available rather than waiting for maintenance tapes that IBM provides to current operating system users.

Marvin said he expects windowing to be useful in the future. "I hope it eventually lets us better emulate PC friendliness. It won't be an initial benefit," he said.

Some users who have tested the windowing facility said it is difficult to learn. "At first, windowing came across as a big pro-

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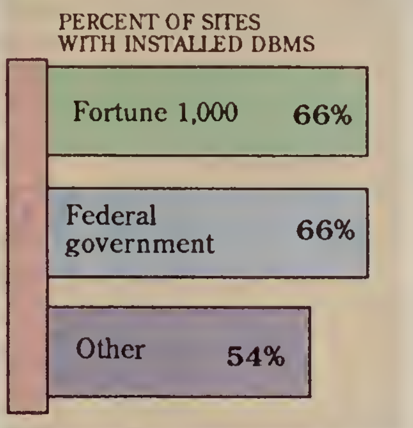
Data View

Mainframe DBMS use by site type

Fortune 1,000 companies and the federal government are equal users of large data base management systems



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHART

VSAM recovery opened

BY ROSEMARY HAMILTON
CW STAFF

CROMWELL, Conn. — Software Technologies and Research, Inc. (STAR) said last week it will release a new version of its VSAM file recovery software next month that automates the entire process.

The initial release of Filesafe, introduced in 1986, offered forward recovery and a few management features. Forward recovery provided automatic updates for copies of files. In the event of a system crash, all the updates made to the original file would also be included in the copy, so new data was not lost.

The new release, Filesafe/Recovery Control System (RCS), is said to include a number of management features that keep track of file locations as well as enable the automatic generation of file recovery.

Filesafe/RCS will also provide backward recovery, a feature that can be used to automatically restore a file to its original state before updates were made, company representatives said.

The release works with the CICS teleprocessing monitor. Within CICS are journals that store data on updates made to files. Filesafe/RCS can access those journals to automatically generate either a forward or backward recovery. For files

Continued on page 26

TI fills in CASE tool network

BY CHARLES BABCOCK
CW STAFF

BURLINGTON, Mass. — Texas Instruments, Inc. has rounded out its line of software development tools with a code generator, a data base generator and a planning tool set, providing one of the few computer-aided software engineering (CASE) tool sets that spans the development life cycle.

Along with previously announced products, the three additions constitute the Information Engineering Facility (IEF), integrated by an underlying encyclopedia. The system currently is limited to developing on-line applications for IBM's DB2 because that is what the data base generator was designed for, said Michael J. Watters, a manager in TI's Information Systems and Services division.

TI officials said the IEF's architecture is not geared to a single data base management system and that it will eventually address multiple data base systems. In addition, development is under way to allow the IEF to interface to another application generator, Pansophic Systems, Inc.'s Telon, Watters said.

"If DB2 is not the best solu-

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Inside

- Sage Software and Index Technology team up to unite application development tools. Page 26.
- Duquesne Systems set to announce console automation system. Page 26.

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Team targets application development tools

BY CHARLES BABCOCK
CW STAFF

BURLINGTON, Mass. — Sage Software, Inc. and Index Technology Corp. recently tied together Sage's application generator on the mainframe with Index Technology's analysis and design tool on the IBM Personal Computer AT.

Called APS/PC Excelerator Integrator, the tool enables a professional programmer to transfer screens, reports and record descriptions that he has created with the Index Technology Excelerator tool into the Sage APS Development Center, Sage Vice-President Gary G. Greenfield said. The center automatically generates a Cobol application from the design.

Critics of computer-aided software engineering (CASE) tools have long bemoaned their inability to transfer the work done at the front end of the application development process to the back end, or application-generator stage.

Sage's Greenfield

The joint effort of the two firms to breach this barrier appears to be in response to that acknowledged shortcoming.

Last year, another CASE firm, Knowledgeware, Inc., merged with Tarkenton Software, producer of the Gamma application generator.

Knowledgeware is believed to be attempting to bridge the same gap.

Greenfield said the transfer of design information to the data dictionary in APS was executed by a link built into APS. The large Cobol generator is installed at 115 sites, he said. About 7,500 licenses of Excelerator have been sold, Index Technology spokesmen said.

The design information is transferred from Excelerator into the APS/PC subdictionary, where the programmer can further develop his application using a screen painter. The information is transferred from the APS/PC to the mainframe APS dictionary prior to generating the application.

The ability to transfer design data from a PC subdictionary to a mainframe dictionary is an unusual feature of the integrator, said Chris Grejtak, vice-president of Index Technology.

APS/PC runs on Microsoft Corp.'s MS-DOS 3.0 or above and is priced at $6,000 per site. A site is defined as a development group sharing a common hardware unit. It is available immediately, Greenfield said.

Duquesne adds console tool

PITTSBURGH — Duquesne Systems, Inc. plans to announce today a tool to automate console operations in MVS data centers.

Automate/MVS assists operators in automating many repetitive operator tasks and in more effectively handling such jobs as managing system message traffic, company spokesmen said.

Automate/MVS allows an operator to analyze the MVS system messages and then specify to the Duquesne software that it initiate a particular action at a designated time of day, the company said.

Within Automate/MVS, a user can reroute messages, reword complicated messages, highlight certain messages or send copies of messages to Time-Sharing Option users.

Other features include a message-recall facility. This allows the operator to bring back a message that has been displayed at an earlier time.

The software ranges from $9,000 to $15,000, depending on processor size.

VSAM

CONTINUED FROM PAGE 25

used in an MVS batch environment, Filesafe/RCS sets up similar journals to keep a record of updates and use those journals to generate recovery of batch files.

Star will sell the software as a complete system or as separate components. Filesafe/RCS has a per-CPU license of $9,500. For users with an existing forward and backward recovery system, Star will offer Filesafe/Journal Control System, which will sell for $6,000. Filesafe/Archive, an automatic CICS journal archiving system, is priced at $3,000.

With this release, Star will replace the original Filesafe product, which costs $5,500, with Filesafe/Recovery Plus. It will be a scaled-down version of Filesafe/RCS and will sell for $4,500. While it does not include many of the management features, it will include a backward recovery capability that the original Filesafe did not have, company spokesmen said.

Filesafe/Recovery Plus will be available this month, along with the Filesafe/Archive component. Filesafe/Journal Control System is scheduled for release next month.

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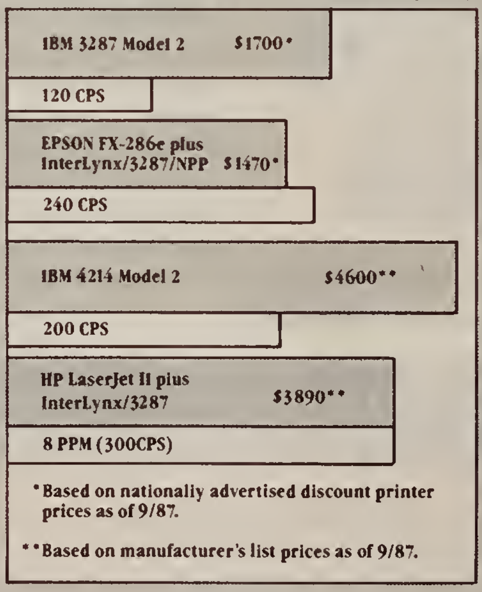

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SOFTWARE NOTES

Du Pont markets custom VAX applications

The Du Pont Co. in Wilmington, Del., has entered the market for custom applications for the Digital Equipment Corp. VAX with the formation of **Du Pont Information Engineering Associates.** Its applications can be ordered and will be custom made within 120 days at a fixed price, according to the company.

The company was formed to take advantage of a software development process that Du Pont has used on 50 of its toughest projects, Du Pont spokesmen said.

Landmark Systems Corp. in Springfield, Va., said The Monitor for CICS can be used with IBM's VSE operating system. It is a real-time monitor that includes batch features for problem analysis and batch reporting.

A permanent license for the VSE version is priced at $8,000.

Pansophic Systems, Inc. in Oakbrook, Ill., and **Cadre Technologies, Inc.** in Providence, R.I., have agreed to jointly develop and market Cadre's Teamwork family of computer-aided software engineering tools. The tool set helps automate structured analysis and design of applications. Pansophic is the producer of the Telon application generator, and the two firms hope to bridge the gap between front-end design tools and the generator. The agreement is key to "evolving Telon to a full system life cycle solution," said David J. Eskra, Pansophic chairman.

Management Science America, Inc. (MSA) in Atlanta has announced that it plans to implement the accounting policies for reporting license fees and support agreement fees recommended by the American Institute of Certified Public Accountants in its recent software revenue recognition paper. The rules call for recognizing license fees when the software is delivered rather than when the contract is signed. They also call for accounting for support revenue over the life of the support agreement rather than on receipt of payment for the agreement. The rules tend to smooth out quarterly results, making them less seasonal.

MSA officials said they are the first publicly held company to implement the rules; officials at Applied Data Research, Inc. in Princeton, N.J., said they implemented them at the direction of Ameritech a year ago. MSA said the rules will result in a one-time charge to net income of $51 million to $53 million and create a backlog of $110 million to $115 million of unrecognized revenue.

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TI fills in

CONTINUED FROM PAGE 25

tion for your application, it would be nice to be able to take those high-level components — the business modeling, the analysis and designs — and use them with some other data base manager," said Ed Acly, a CASE tool researcher at International Data Corp. in Framingham, Mass.

The code generator, the encyclopedia and the data base generator reside on the mainframe and are priced at $265,000. The Planning, Analysis and Design tool sets are used on IBM Personal Computer ATs or compatibles, including the TI Business Pro.

The sets are priced at $13,900. All components are scheduled to be available in December.

The IEF uses the Information Engineering methodology developed by James Martin Associates. After going through a set of front-end steps of conceptualizing and modeling the business relationships, the approach allows the business models to be converted into data relationships and diagrams that can be fed into the code generator, TI officials said.

The IEF could be viewed as a competitor to Information Engineering Workbench, a product from Knowledgeware, Inc., an Ann Arbor, Mich., firm that also uses Martin's methodology, Acly noted. Knowledgeware is the result of a recent merger combining the analysis and design tool firm and Tarkenton Software, Inc., producer of the Gamma application generator.

The code generator produces IBM's VS Cobol II, a close equivalent to ANSI-standard Cobol 85, TI spokesmen said.

Acly termed the integration of the tools, encyclopedia and generators as "pretty tight" and the overall system as "very powerful" compared with stand-alone tools on the market that cannot offer a fundamental level of integration. The mainframe encyclopedia allows the multitool integration, he said.

The IEF is still missing a component for doing batch systems, he noted.

The code generator produces Cobol applications for use under either IBM's IMS/DC or CICS teleprocessing monitors. Once designed, an IMS/DC application could be reconfigured for CICS automatically, said Eldon Patterson, manager of product development for TI's Information Systems and Services division.

The data base generator builds a DB2 data base design using Entity Relationship Diagrams defined with the IEF Analysis tool set.

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Object

CONTINUED FROM PAGE 25

Michael J. Carey and David J. DeWitt at the University of Wisconsin, working on the Exodus DBMS system, say they have taken an object-oriented approach because computer-aided design and manufacturing applications, scientific/statistical applications and image/voice applications "cannot be properly supported by existing data base management systems."

The idea of an object-oriented system is to "structure the program around data abstractions rather than procedural abstractions," says Lawrence A. Rowe with the Computer Sciences Division of the University of California at Berkeley.

An important by-product of this approach is that an application developer builds up a library of reusable objects.

Programming with objects consists of sending messages between them, using a language like Objective C. An analogy to object messaging has been made to a loan approval system. To obtain a loan, an applicant must submit a reply. The recipient of the application performs a series of analyses on the data available before sending back an approval or rejection.

"The conventional distinction between data and procedures is reduced. The meaning rides with the objects of the system. The code remains an abstract form directing the flow of communications," writes Dimitris N. Chorafas in "Fourth and Fifth Programming Languages." An object, in this case, is a set of predefined functions designed to operate on data specific to those functions.

Each object knows its class or rank in a hierarchy. An operating system, for example, works on a well-defined set of objects: a processor, a unit of memory and communications channels. In the class of output objects, printers would reside in a class lower than the most general class of output peripherals, while plotters and laser printers would reside still lower.

Objects supposedly contain a degree of intelligence. They decide after receiving a message how to process it.

In a more general sense, what is going on here is the opposite of top-down functional decomposition typical of most large systems development, according to Bertrand Meyer, president of Interactive Software Engineering in Goleta, Calif. Meyer is the author of an Institute of Electrical and Electronics Engineers report on object-oriented design that was released in March.

"Instead of building modules around operations and distributing data structures between the resulting routines, object-oriented design does the reverse. It uses the most important data structures as the basis for modularization and attaches each routine to the data structure to which it applies most closely," Meyer writes. This is contrary to the notion of a main program acting on data sets in data bases. Programs typically try to move data into position for routines or operations to be performed on it. "The remedy, which leads directly to object-oriented design, may be expressed by the following law: If there is too much data transmission in your routines, then put your routines into your data."

Moving to object-oriented systems may not be all that easy, Meyer allows. "To programmers trained in functional approaches, this is as revolutionary as making the Sun orbit Earth," he says.

Advocates of object-oriented programming say there are tremendous productivity gains to be realized. Fewer lines of code need to be written, the concentration of function and data makes it easier to isolate problems and correct them.

If object-oriented programming is so good, why hasn't it become better established? I don't have the answer to that, but some software companies believe object-oriented programming has a great future. After all, wasn't the relational model around for years before it suddenly emerged in a viable form?

Babcock is *Computerworld's* senior editor, software & services.

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VM update

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ductivity aid, but it isn't quite that," said Philip Smith, a programmer at VM Systems Group, Inc., which sells utility software for VM. "You need to do about 20 commands to get it going, and most people here haven't figured it out yet."

According to Gabe Goldberg, vice-president of research and development at VM Systems Group, "Lots of the new functions are very nice, but some, like windowing, have the flavor that they were done in isolation from user input."

Despite drawbacks, the new VM release has provided features with which users are pleased. While Smith at VM Systems Group said the multiple foreign language support is "nice, but who needs it?," Analog's Marvin said he is impressed with it because his company has many overseas offices that can make use of it.

Buba said he plans to use the full-screen support in IBM's Conversational Monitor System and the enhancements in storage utilization. He now runs Release 5 as a guest under Release 4 and plans to move to the Release 5 High Performance Option when it becomes available this fall.

"I've played around with the windowing and tried to get used to some of the commands," Buba said. "Up front, it does seem very difficult to use, but that's like anything new."

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NEW PRODUCTS

Systems software

Intermation Corp. has ported its **IT OS** document management system to AT&T Unix System V.

Features of IT OS include status line, multiple cut and paste buffers, full-screen editing, spelling correction, multinational keyboard support and math and calculator capabilities.

Other features include opening multifiles, conversion of data base application files to list processing, laser printer support, diagram editor and integration of text and graphics within a document. The system also provides system management support, individual storage for such functions as ruler settings, printer settings and user-defined routines and support of the same file structure between all systems.

IT OS costs from $950, based on the number of users and the system configuration.

Intermation, 234 E. Colorado Blvd., Pasadena, Calif. 91101. 818-796-9371.

The **1987 Fixed Assets Management System/On-Line** (FAMS/OL) for the IBM System/36 has been enhanced by **Gary Brown Associates, Inc.**

Written in RPG-II, FAMS/OL is said to provide users with a tool for asset accounting and property reporting. It maintains data for depreciable and nondepreciable assets.

Enhancements include additional reports for federal tax forms 4562, 4562A and 4255; increased company number to two positions with 99 companies available, with up to 99 divisions in each company available; user-defined major, intermediate and minor control levels that can accommodate up to 99,999 descriptions; and expanded general ledger asset account number to 20 positions.

FAMS/OL costs $2,500.

Gary Brown Associates, 322-B Edwardia Drive, Greensboro, N.C. 27409. 919-852-0550.

Crime Records Information Management System (CRIMS), an interactive software system designed for law enforcement agencies, has been announced by **NCR Corp.**

The automated information storage, retrieval and processing system is said to provide information about criminal history. It assists law enforcement officials in analyzing crime trends, methods of operation and statistics. It also generates monthly Uniform Crime Reports (UCR).

The system runs on ITX/IRX and RM/COS operating systems. It consists of the following 10 modules: the UCR base module, calls for service, traffic accidents, traffic tickets, warrants, criminal intelligence, drug traffic, parking tickets, employee maintenance and vehicle maintenance.

CRIMS costs $17,650.

NCR, 1700 S. Pattterson, Dayton, Ohio. 45479. 513-445-4169.

Applications packages

Image/3X, a software system said to allow users to capture and recall full-color, television-quality images using an IBM System/36 or 38 minicomputer, has been announced by **I/Net, Inc.**

Original images, including slides, photographs, videotapes and printed photographs, are reportedly digitally converted to the computer, producing full-color duplicate images.

The Image/3X system consists of IBM-compatible software and documentation and image-capture hardware. It costs about $20,000.

I/Net, 2225 Winters Drive, Kalamazoo, Mich. 49002. 616-344-3017.

Computerline, Inc. has ported its **Plantrac** project management software to Digital Equipment Corp. VAX/VMS environments.

Plantrac/VMS is an integrated critical-path-method project management system said to manage up to 250,000 activities in a single project. Each subproject is available for individual analysis, and a multiproject feature allows users to link up to 100 subprojects and allocate across projects. Features include a graphics module and a report generator.

Plantrac/VMS supports an unlimited number of simultaneous users. Each terminal acts as a virtual personal computer.

According to the vendor, Plantrac/VMS is compatible with other versions of Plantrac. It costs from $2,995 to $6,995.

Computerline, 52 School St., Pembroke, Mass. 02359. 617-294-1111.

Release 2.0 of the **A/R Paid Invoice History** system, an IBM System/36-based package designed to enhance the IBM MAPICS/DMAS Accounts Receivable module, has been announced by **Daly & Wolcott, Inc.**

The upgrade features a customer name search; an expanded comment section; addition of credit memos and adjustments to the paid invoice history inquiry and report; addition of contact name, data of last contact and credit limits to inquiry screens; roll keys; automatic default to company 01; additional customer-profile report; aged trial balance report in summary or detail format; and a utility menu.

The A/R Paid Invoice History package costs $1,000. Existing customers can upgrade to Release 2.0 for $300.

Daly & Wolcott, P.O. Box 1509, East Greenwich, R.I. 02818. 800-343-2414.

Two manufacturing packages have been added to the **Manufacturing System** for the Hewlett-Packard Co. HP 3000 series by **MCBA, Inc.**

The modules, Job Costing and Labor Performance, integrate with the vendor's existing accounting and distribution modules for the HP 3000.

Job Costing reportedly provides cost reporting and variance analysis for labor, materials and subcontracting. It allows cost analysis by job, department or work center. Labor Performance reportedly tracks employee production and allows for entry of clock card data.

Prices for Job Costing and Labor Performance range from $5,000 to $7,500 per package.

MCBA, 425 W. Broadway, Glendale, Calif. 91204. 818-242-9600.

Innovative Software, Inc. has ported its **Smart Software System** to the AT&T 3B line of computers.

The Smart Software System is a colabeled Unix product. It features the Smart Word Processor with spell checker, the Smart Data Base Manager and the Smart Spreadsheet with business graphics. It also features full asynchronous communications capabilities, a time manager and the Smart Programming Language.

Pricing ranges from $2,895 on the 3B2/300, 310 or 400 to $4,490 on the 3B5/15.

Innovative Software, 9875 Widmer Road, Lenexa, Kan. 66215. 913-492-3800.

Control Data Business Centers, part of Control Data Corp., has announced a micro-based human resources management system that integrates with its mainframe payroll service.

Designed for companies with 50 to 300 employees, the system, called basic **HRMS**, consists of micro-based human resource software, the vendor's Orchestrator mainframe-to-micro link software and mainframe payroll processing services.

Features include Cobra tracking and reporting, a flexible report writer and payroll interface, 60 standard reports and the ability to store 600 data elements per employee.

The system costs $450 per month. Fees for payroll processing average $1.50 per employee.

Control Data Business Centers, 8100 34th Ave., Minneapolis, Minn. 55440. 612-853-4303.

Computer Associates International, Inc. has ported its **CA-Tellaplan** project management software packages — CA-Tellaplan Expert and CA-Tellaplan Professional — to Apollo Computer, Inc. workstations running the Aegis operating system.

The software calculates and visually represents critical paths, dependencies and slack/float time. Features include "what-if" capabilities, a flexible planning calendar and start-to-end and end-to-start planning capabilities.

CA-Tellaplan Professional handles up to 2,000 tasks per project; CA-Tellaplan Expert handles up to 10,000.

Typical pricing for CA-Tellaplan Professional is $4,500, with

Continued on page 34

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Continued from page 32

the cost of each additional networked copy averaging $1,600. Typical pricing for CA-Tellaplan Expert is $9,300 and $3,300 for each additional networked copy.

Computer Associates, 1 Tech Drive, Andover, Mass. 01810. 617-685-1400.

Languages

Version 3.0 of the development language **Speed I** has been introduced by **Tom Software, Inc.**

Version 3.0 includes both a hashed-access method and an indexed-sequential method of data retrieval. According to the vendor, any data element can be retrieved by either method.

Speed I lets the user set up both primary and multiple alternate keys for any record and to specify either method of access for any of the keys.

Other features include screen painting; data dictionaries; design and data base functions; subroutines; and ad hoc reporting.

Speed I Version 3.0 runs on more than 120 models of micros and minicomputers. It costs from $1,000. Speed I-based applications start at $1,000.

Tom Software, 127 S.W. 156th St., Seattle, Wash. 98166. 206-246-7022.

Utilities

A spreadsheet text-file printer program called the **20/20 Widewriter**, designed for Digital Equipment Corp. VAX and Microvax computers, has been announced by **Access Technology, Inc.**

Widewriter reads and prints spreadsheets and other documents that are too wide to print in a standard 80- or 132-col. format. It also rotates the text of the document and prints it down the page instead of across it.

The menu-driven package provides six character sizes as well as provisions for skipping over perforations and adjusting margins, print density and character and line spacing. It supports DEC's LA50, LA100 and LA210 printers.

Widewriter costs $500 for VAX systems and $250 for Microvax systems.

Access Technology, 6 Pleasant St., S. Natick, Mass. 01760. 617-655-9191.

An interactive development center for Cullinet Software, Inc. users, based on TSO/ISPF, has been announced by **Data Base Architects, Inc.**

The vendor said the **Online Workbench** includes customized workstations that provide access to Cullinet compilers, utilities and reporting facilities in addition to tools that can be provided by third-party vendors.

It includes on-line help and prompts the user for the correct parameters, according to the vendor.

Online Workbench is priced at $36,000.

Data Base Architects, Suite 1700, 2101 Webster St., Oakland, Calif. 94612. 415-446-7744.

A set of batch and on-line IBM CICS programs for submitting streams of IBM's JCL from within CICS into IBM's MVS/JES has been introduced by **D. L. Brickey and Associates, Inc.**

CICS JCL Submit Facility features concurrent job submissions; a full-screen editor operating within CICS; an application program interface with sample programs provided; and fourth-generation language support.

In addition, the vendor said, the product features the ability to maintain and create JCL in CICS and batch, time-delay submits and the ability to submit JCL from a batch job.

The programs are written in assembler and use standard IBM interfaces. The license fee is $1,600.

D. L. Brickey, Box 44, R. R. 1, Rochester, Ill. 62563. 217-498-8479.

Tracealyzer, a real-time program tracer and software performance analyzer, has been announced by **Softaid, Inc.**

Tracealyzer, an optional upgrade to the vendor's Icebox line of in-circuit emulators, is said to transparently monitor how often each instruction in a target system is executed.

Sixteen million counts per instruction can be accumulated.

According to the vendor, the Tracealyzer counts the execution of every instruction, including routines that are run only once.

The Tracealyzer produces a histogram of program activity; in addition, it gives the Icebox a 1K-byte-deep real-time trace buffer.

It captures the address, data and status signals from the target system, according to the vendor.

Tracealyzer costs $1,495.

Softaid, 8930 Rt. 108, Columbia, Md. 21045. 301-964-8455.

A product said to allow Wang Laboratories, Inc. VS users to implement completely distributed applications within a networked Wang VS environment has been announced by **Voyager Systems, Inc.**

The software, which is called **Distributed Information Access Link** (DIAL), provides its distributed data management functions by allowing any application to access files on remote VS systems as if the files were local, according to the vendor.

The DIAL-server software component features the ability to operate as a background task on every VS that is configured within the network.

DIAL is priced from $5,000.

Voyager Systems, 35 Constitution

Continued on page 36

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Continued from page 34

Drive, Bedford, N.H. 03102. 603-472-5172.

Biles & Associates has enhanced its **BH-3000** software package to allow downloading of commands and targets from Digital Equipment Corp. VAX systems to Honeywell, Inc. TDC-3000 systems.

Version 2 of the package is said to allow transfer of analog, digital and status-control information and to permit the gathering of data from TDC-3000 systems for processing and storage in VAX systems.

The BH-3000 allows a TDC-3000 to start and stop programs in the VAX CPU and provides data exchange between Honeywell Local Control Networks, the vendor said.

Also included with the system are utilities for checking, monitoring and controlling the status of communications links in addition to a documented library of user programs.

The BH-3000 system is priced from $30,000.

Biles & Associates, Suite 500, 6161 Savoy Drive, Houston, Texas 77059 713-789-8880.

Redmond Technologies has enhanced its **Line Monitor/38** general-purpose utility package, which was designed to handle routine IBM System/38 communication line problems.

According to the vendor, Version 4.0 of the software includes an inclusion/exclusion table that has the ability to control which lines, control units or devices are monitored.

The product also features the ability to vary on-line control units and devices that are varied off and the ability to send informational messages when the software varies on or off communication units, the vendor said.

In addition, execution priority has been added to the System Control Screen for unattended operation.

A user exit routine can be called when a line, control unit or device fails.

Also, the system checks lines, control units and devices when failures are detected.

The software costs $495.

Redmond Technologies, 106A Timber Ridge Drive, Ashland, Va. 23005. 804-798-4315.

Services

A national information service designed to help solve technical and manufacturing problems and improve technical decision making has been announced by **Teltech, Inc.**

The **Teltech System** features the Expert Network, which the vendor claimed links clients to scientific authorities that are appropriate to their specific technical information needs through the use of personal computers in addition to dedicated terminals.

The product also features Print Information Access, a feature that reportedly uses computer and telephone communication to locate and review technical information in print.

Additionally, the standard Teltech System includes a curriculum of professional development courses, according to the vendor.

Yearly subscription charges range from $3,000 to $10,500.

Teltech, 9855 W. 78th St., Minneapolis, Minn. 55344. 612-829-9000.

Development tools

D. Appleton Co. has released **Version 2.0** of its **Data Resource Leverage** information systems, which is a computer-aided software engineering (CASE) product.

Designed to shorten the time required for planning and implementing very large integrated information systems, Data Resource Leverage is an automated language for defining and managing information assets.

It also provides support for structured methods.

According to the vendor, Data Resource Leverage has the ability to merge complex models and verify normalization of data in addition to generating SQL-create statements for IBM's DB2.

The product is available for IBM MVS and Digital Equipment Corp. VMS environments.

The license fee, including software, documentation, workshops, modeling templates and installation support, costs $80,000.

D. Appleton, Suite 220, 1334 Park View Ave., Manhattan Beach, Calif. 90266. 213-546-7575.

Metier Management Systems, a subsidiary of Lockheed Corp., has ported its **Artemis** project management software to Digital Equipment Corp. VAX systems.

The Artemis line includes the Artemis 7000 application development language and data base management system; Artemis Project, a project management application based on Artemis 7000; and Interactive Project Graphics for bar chart and network drawing.

Artemis 7000 products are available for VAX/VMS environments.

They are compatible with Metier's micro-based project management products, the vendor said.

Pricing starts at $35,000 for Artemis Project and at $60,000 for an Artemis 7000 five-user license. An Interactive Project Graphics two-user license costs $23,000.

Metier, Suite 1300, 2900 N. Loop W., Houston, Texas 77092. 713-956-7511.

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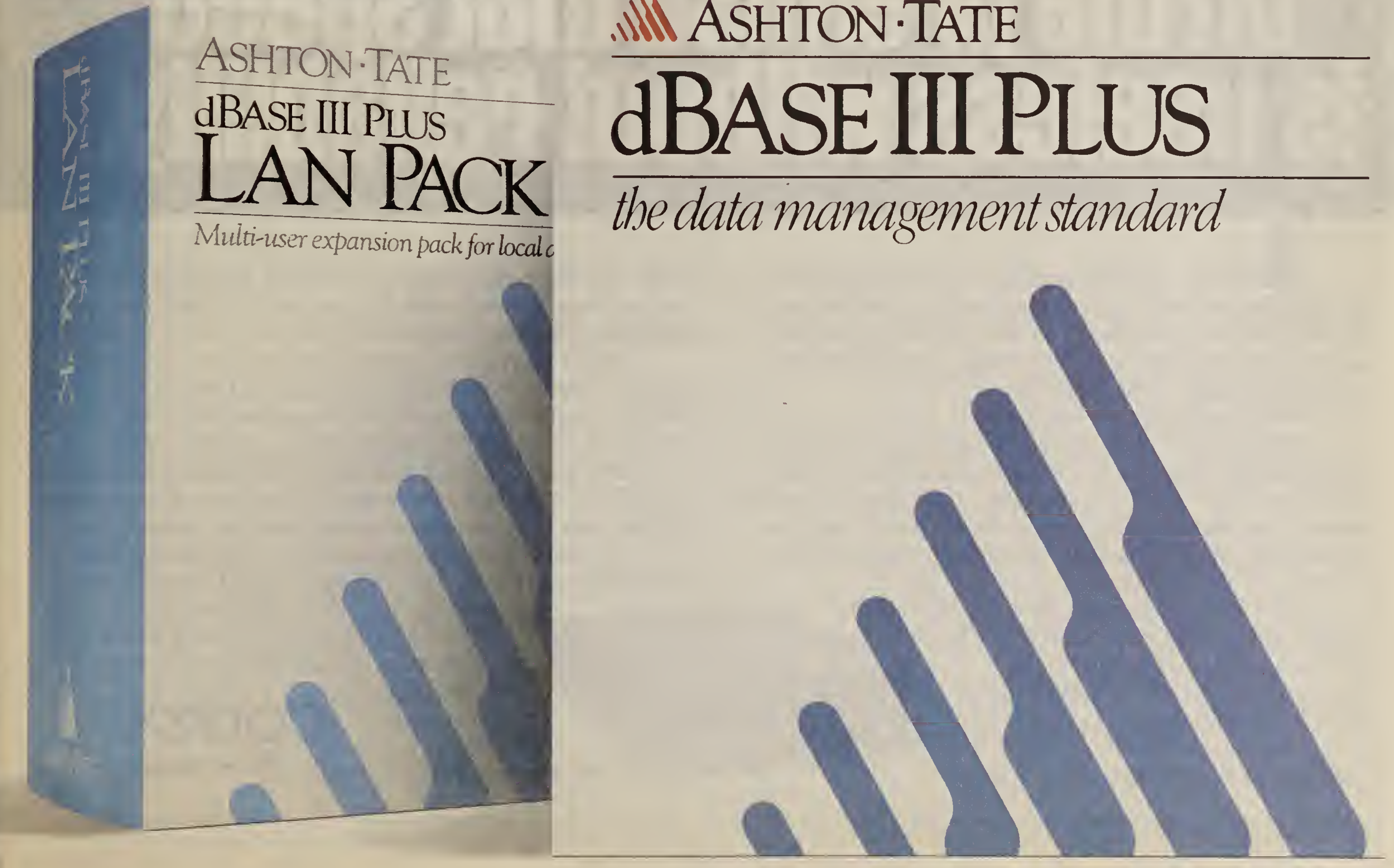
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MICROCOMPUTING

SMALL TALK

William Zachmann

Adding light to CD-ROM

Compact optical-digital disks like those rapidly becoming the standard for high-fidelity stereo sound systems also have tremendous potential for data storage. But many analysts have claimed that until writable optical media are available, optical data storage will be of little value.

Nothing could be further from the truth. The 600M-byte capacity of a removable 4.7-in. compact disk/read-only memory (CD-ROM) disk affords a fantastic vehicle for making large amounts of information available in machine-readable form to users of personal computers.

There has been, however, a kind of chicken-and-egg problem with regard to CD-ROM use. Even though good drives are available, CD-ROM just hasn't built up to critical mass yet.

Microsoft, a pioneer in the CD-ROM field, hopes to change the perception of CD-ROM with Bookshelf, a series of disks that contains 10 useful reference tools and the software needed to use them. The $295 Bookshelf may just break the impasse. It is a fine combination for anyone who does any signifi-

Continued on page 47

Boards said to turn XTs into parallel processors

Microway claims boards boost speed, memory

BY DOUGLAS BARNEY
CW STAFF

PLYMOUTH, Mass. — A series of add-on boards that reportedly turn an IBM Personal Computer XT, AT or compatible into a true parallel processing machine has been released by Microway, Inc.

Dubbed the Monoputer, these boards provide faster processing speed and, with specially tailored applications, parallel processing.

The Monoputer has been available in Europe, where some 400 are currently in use.

The heart of the Monoputer is the Transputer, an Inmos, Ltd. T414-G20 32-bit processor running at 20 MHz, which includes 2K bytes of 50-nsec static random-access memory (RAM).

The Transputer comes with four serial links that can communicate with other processors, a multiplexed address and data bus and the hardware needed to generate memory control signals.

The board also comes with 2M bytes of 100 nsec dynamic RAM.

Linkable

Users can link each Monoputer to as many as four others, which can be additionally linked to other networks, according to the firm.

For Mark Brule, the Monoputer is the only cost-effective

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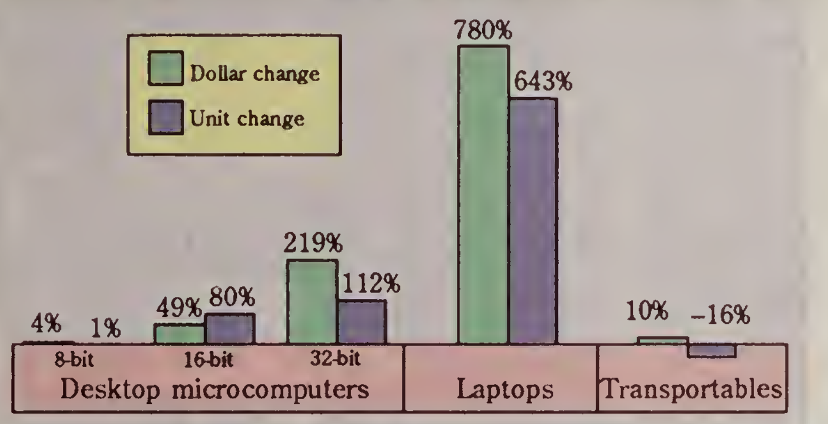
Data View

Retail shelves

Changes in microcomputer orders in first six months of 1987 from year-earlier half



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CW CHART

PC software pioneer ends missionary work

Despite a background in business and civil engineering, Rob Campbell stumbled into the software business in 1975, when he cofounded Dakin5. Named after his then-street address, the firm introduced a general accounting package for the then-fledgling Apple Computer, Inc. Apple II in 1979.

Campbell says he and Apple cofounder Steve Jobs wrote possibly the first micro software publishing agreement on a polymorphic word processor with no attorneys. "We wrote it in one night on our own."

> "THE TECHNOLOGY business has been horrid in communicating to end users why they should go into stores and buy their products."
>
> ROB CAMPBELL

In late 1979, Campbell joined Apple to head up its application software marketing group. "It was a lot of fun because we didn't have a clue as to where the software business was going." He took $70,000 worth of revenue and turned it into $70 million in 3½ years, putting Apple into a dead heat with Visicorp as the leading software vendor.

Campbell recently spoke with *Computerworld* Senior Editor Patricia Keefe about the sale to Microsoft Corp. of his pioneering venture into the desktop presentations market, Forethought, Inc., which was launched in 1983. He also talked about his plans for the future and his views on software.

Why did you sell Forethought?

We found ourselves in a position of having to do an awful lot of missionary work in trying to open up the new desktop presentation category. Missionary work, as a general rule, has long lead times and is very expensive. We were concerned about being able to muster enough resources to capture a dominant position before some competitor came in and took it away from us. Also, we discovered that Microsoft had been very interested in this market segment. And, quite frankly, they got our attention with a very strong offer.

Above market value?

I like to think there was good val-

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Inside

- Paperback enhances VP-Planner. Page 43.
- Aox board triples speed of PC AT and compatibles. Page 45.
- MGMstation designs storage compartment for NASA's Space Station. Page 46.

IMS DB/DC on a PC? They said it couldn't be done. It's now available as an option for VS COBOL Workbench.

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Boosts productivity with easy to read character set and advanced ergonomics.	Likewise.
Manufactured, serviced and supported by the company that ships more terminals than anyone but IBM.*	Likewise.
At $599, the Wyse WY-60 delivers unrivaled value if you're looking for sharp resolution, advanced features and superior overall quality in an AT-compatible alphanumeric terminal.	At $649, the Wyse WY-99GT delivers likewise in a graphics terminal, with Hercules and IBM CGA compatibility.

So if you're looking for the best terminal to turn your AT into a multi-user system, there's really no choice like Wyse. For more information, call 1-800-GET-WYSE.

WYSE

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Trademarks/Owners: Wyse, WY 60, WY 99GT/Wyse Technology; IBM AT, IBM CGA/International Business Machines; Hercules/Hercules; Lotus 1-2-3/Lotus Development Corporation; Multiplan/Microsoft. *IDC 1986 U.S. Terminal Census.

Paperback enhances VP-Planner; says upgrade unrelated to Lotus suit

BY JULIE PITTA
CW STAFF

BERKELEY, Calif. — Paperback Software International last week introduced an enhanced version of VP-Planner, a Lotus Development Corp. 1-2-3 Version 1A work-alike, saying its decision to do so was not based on the lawsuit filed by Lotus in January.

That suit charged Paperback Software with copyright infringement, claiming that VP-Planner violates the "look and feel" of 1-2-3.

"It has nothing to do with the lawsuit," said Adam Osborne, president of Paperback Software. "It's a frivolous lawsuit, and we're not going to allow it to affect the way we do business."

A court date for a preliminary hearing on the charges has not been set.

Paperback Software also announced last week updated versions of VP-Expert, an artificial intelligence-based software tool, and VP-Info, a relational data base compatible with Ashton-Tate's Dbase II and III and III+ series.

No more protection

Paperback Software also announced that it has removed copy protection from its entire product line.

Customers with copy-protected versions of Paperback Software products can receive noncopy-protected disks when they register their software, Osborne said.

The company raised prices on VP-Graphics, VP-Expert and VP-Info. Prices have been boosted to $124.95 from $99.95.

VP-Planner, Paperback Software's 1-2-3 Release 1A-compatible program, has been upgraded to emulate Lotus's 1.37 version.

The enhanced package, called VP-Planner Plus, works with Frontrunner Development Corp.'s CPA+ accounting program and is available immediately, according to the company.

Enhances VP-Expert

VP-Expert has been updated to Version 1.2; new features include a windowing package and an extension of text strings to 40 from an original of 20. It requires 384K bytes of memory and two floppy drives or a single hard disk drive.

VP-Info has been upgraded to Version 1.4. Twenty new commands and functions have been added, and problems with the original package have been corrected, officials said.

The new version requires 384K bytes of memory, two floppy drives or a single hard disk drive.

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338740-4

Aox says 386-based board lights up AT's afterburners

BY ED SCANNELL
CW STAFF

WALTHAM, Mass. — Aox, Inc. has introduced a 16-MHz Intel Corp. 80386-based add-on board that the company said triples the speed of IBM's Personal Computer AT and compatible systems.

The product, called the Master 386, allows users to boot up their systems in 80386 mode and allows them to switch between the 386 and the Intel 80286 with a single keystroke. To accommodate the timing dependencies of floppy disk-based programs with protection schemes, the 80386 slows down during a floppy-disk access, assuring compatibility with users' existing software, a spokesman explained.

The Master 386 directly accesses the memory and I/O capabilities of the motherboard, avoiding the usual performance degradations users get with true coprocessor boards, according to Aox President Michael Aronson. "If a true coprocessor board wants to access a graphics board, it can't do it because it needs the main processor to intervene to move the stuff for you," Aronson said. "But because we are a master, we have the same performance advantage as if you had plugged in a cable that directly accesses all peripherals."

While the Master 386 can be used with a wide variety of applications, the company plans to make a strong marketing push in the desktop publishing, computer-aided design and engineering and software development markets, according to Aronson.

Meets the specs

In addition to the 80386, the Master 386 features zero-wait state cache memory, a socket for an optional Intel 80387 coprocessor and a connector for Aox's 16M-byte memory expansion card. The product is compatible with the latest version of the Lotus-Intel-Microsoft Expanded Memory Specification and the Enhanced Expanded Memory Specification from AST Research, Inc., Quarterdeck Office Systems, Inc. and Ashton-Tate.

The board plugs into any 16-bit expansion slot and does not require users to remove chips, connect cables or install software, a spokesman noted.

Asked when Aox would have a 20-MHz version of the product available, Aronson declined to comment but said the company will "deliver one soon." The Master 386 is priced at $1,595 and will be sold through Aox's direct sales force. The product is scheduled to ship in November.

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Mac CAD tool reaches for the stars

MGMstation designs storage area for weightless space station locale

BY ALAN J. RYAN
CW STAFF

Weightlessness (n): the state of lacking apparent gravitational pull.

Reckoning with weightlessness was a major consideration for Design Edge in Houston when it took on the enviable task of designing the crew storage system for the National Aeronautics and Space Administration's Space Station.

After the firm chose Apple Computer, Inc.'s Macintosh computer as its main tool 18 months ago, senior partners Richard Haner and Chipp Walters also selected, almost by chance, a computer-aided design (CAD) package called MGMstation by Micro CAD/CAM, Inc. in Los Angeles.

'Intrigued'

"We were both intrigued with the Mac," Haner said, "but one problem is that there wasn't a really good acknowledged high-level CAD package for it at the time."

Haner said some of the packages the team considered were too expensive, and some were much too slow. "We found MGMstation in an ad in the back of a magazine, and we sent away for a beta copy of it. We realized that it had serious power, and for the price, it was better than Autocad or Versacad."

> "IT [WEIGHTLESSNESS] turns out to be a very weird world. You can't turn doorknobs. . . . The human being will rotate around the pivot axis of the handle."
>
> RICHARD HANER
> DESIGN EDGE

After selecting the CAD program, Haner said, he and Walters had to compile a massive data base of what the crew needed to store and the kind of room they needed for personal effects and items needed for routine daily activities.

"There was so much stuff that the locker became a catchall for everything from toothbrushes to cameras to clothing," Haner said. The entire unit measures only 42 in. across, 80 in. high and 44 in. deep.

But the most difficult part of the design process was thinking in terms of weightlessness. "As a designer, it's truly a unique environment. You really have to change your way of thinking."

For instance, Haner added, when a drawer is opened in a weightless environment, "You have a jack-in-the-box effect. Everything just blows out of the drawer" because of the movement of the drawer combined with the lack of gravitational pull. To combat that problem, the team designed, with the help of MGMstation, an expandable netting for quick-use storage and cannisters with rotational covers to hold small items. Primary drawers have net covers to retain equipment when the drawer is open.

"It turns out to be a very weird world. You can't turn doorknobs," Haner said, unless the action is countered by another source. "For example, if you have a standard door handle that you want to twist, well, you're not going to twist that. What will happen is the human being will rotate around the pivot axis of the handle and never open the handle. You push a pencil and it can push you in an opposite direction."

And gate-type latches that use a latch dropping over a pin to lock do not work in space. Therefore, the Design Edge team designed all spring-loaded mechanisms for use in the space station's storage compartment.

Haner said he and Walters were not given the opportunity to develop or check their design in a weightless environment. "That would have been the best piece of research we could have done on the project," he said. "Unfortunately, that is an expensive thing for NASA to do, and they didn't feel it was justified."

According to Haner, the launch dates for the NASA Space Station are 1993 or 1994.

Currently, Design Edge is hoping to land yet another NASA contract, this one based on the design of the Crew Emergency Rescue Vehicle (CERV), which Haner likened to a lifeboat for the space station.

If there were an emergency, problem or injured crew member, the CERV would be available to transport the crew member or members back to Earth within 48 hours, Haner explained. "It's guideable to a certain degree, but it's not like the shuttle," he added.

Lotus draws up product list

CAMBRIDGE, Mass. — A catalog of products that work with 1-2-3 and Symphony has been created by Lotus Publishing, a division of Lotus Development Corp.

The catalog lists some 75 products available either from third parties or from Lotus through the catalog. Lotus said each product has been evaluated and comes with a 30-day money-back guarentee; prices range from $12 to $3,100.

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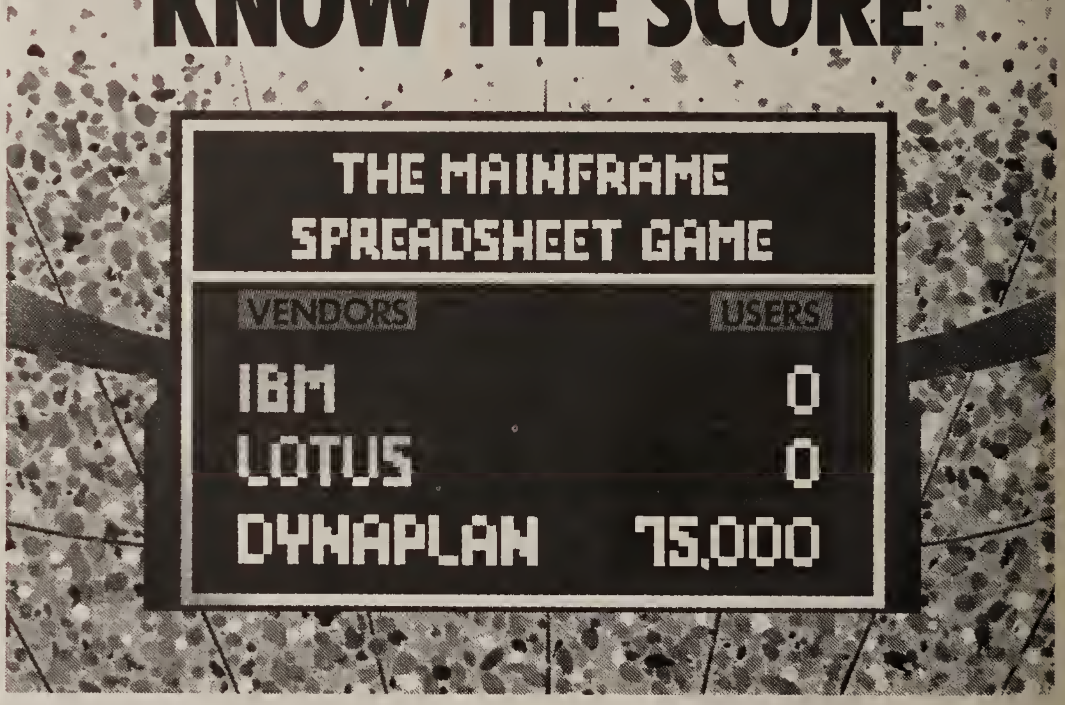

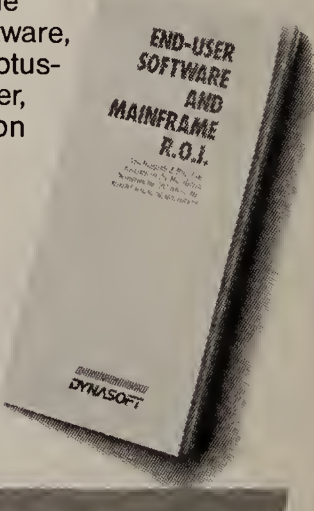

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DYNASOFT

Boards

FROM PAGE 41

way to implement parallel processing. "We can express algorithms in a parallel fashion," said Brule, who is vice-president and chief scientist of Coherent Research, Inc. in Syracuse, N.Y.

Coherent is developing a Prolog interpreter to work with the Monoputer and take advantage of its parallel processing capability.

'Heck of a microprocessor'

"The only other parallel processing computers are large. If we did not have the Monoputer, we would be doing our work on a theoretical, rather than practical, level," Brule explained.

"It is also a heck of a microprocessor," he added.

Brule said he expects the bulk of Monoputer sales to go to research groups within large corporations interested in investigating parallel processing.

Because current versions of popular languages do not support parallel processing, Microway said it will offer special versions of C, Fortran, Prolog and Pascal to work with its system.

The versions are priced at $750 each.

Thoroughbred bundles first turnkey micro

BY ED SCANNELL
CW STAFF

SOMERVILLE, N.J. — Concept Omega Corp.'s Thoroughbred Division announced its first turnkey microcomputer last week. The 16-MHz Intel Corp. 80386-based system is bundled with the company's multitasking, multiuser operating system and is compatible with IBM's Personal Computer XT and PC AT.

Dubbed the TS-386, the system is intended for small to medium-size business applications. In addition to the operating system, the micro comes packaged with Thoroughbred's version of Basic.

The product is available with a wide choice of storage options, according to a company spokesman. Currently, Thoroughbred/OS, along with associated memory and multiport expansion boards, can be configured for three, six, 10 or 16 users. The company said it plans to unveil options allowing corporate users and developers to support up to 32 users by year's end.

Previously, Thoroughbred sold separately its multiuser operating system, its version of Basic, memory boards and controllers. The company said it decided to bundle these products into a system to satisfy the demand of customers who wanted the convenience of a single-source business systems solution.

"We have taken the approach where you can buy it all assembled or buy it in pieces and put it together yourself," said Roger Sparks, vice-president of marketing for the Thoroughbred product line.

Thoroughbred/OS, which was originally developed for the XT several years ago, has its own file system that co-resides on a hard disk with a Microsoft Corp. MS-DOS file system. However, MS-DOS-compatible files cannot be run as a task under the multiuser operating system, according to Sparks.

"You can run MS-DOS programs on the monitor, but then you have to reboot the system to boot our system," he said.

Adding light

FROM PAGE 41

cant amount of writing on a PC.

The 10 references on the Bookshelf disk include *The American Heritage Dictionary, Roget's II: Electronic Thesaurus*, a spelling verifier and corrector and a usage alert, all from Houghton Mifflin Co.

Little, Brown & Co.'s *Bartlett's Familiar Quotations,* Newspaper Enterprise Association, Inc.'s *The 1987 World Almanac and Book of Facts*, the University of Chicago Press's *The Chicago Manual of Style* (13th Edition), a U.S. ZIP Code Directory, the University of California's *Business Information Sources* and a large collection of standard forms and letters compose the other five.

Software-driven

What really makes the whole thing hum, however, is the software Bookshelf provides to access this comprehensive collection of reference sources.

The package provides terminate-and-stay-resident software that makes available powerful lookup and retrieval tools for accessing the reference material on the disk.

When you want to access Bookshelf, you simply hold down the combination of the Alt and left Shift keys on your IBM or compatible keyboard.

A menu bar comes up on the second line of the display with entries for the 10 reference sources along with Options and Help selections.

An efficient index-and-search capability is provided for all the reference works. There are all kinds of useful features for looking up information as well as for cutting and pasting it into your document.

If, for example, I want to find quotes about information, I simply call up Bookshelf with the cursor at the end of the word in this document, select Quotes from the menu, search for a quote I like and highlight the text by holding down a Shift key and moving the cursor over the text.

Next, I use the Edit item on the browse menu to copy it to the Bookshelf clipboard and then paste it in here, like this:

> *Knowledge is of two kinds.*
> *We know a subject ourselves,*
> *or we know where we can*
> *find information upon it.*
> Samuel Johnson

Zachmann is vice-president of research at International Data Corp.

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isn't from a camera...

Software pioneer

CONTINUED FROM PAGE 41

ue. I think that what we had been able to do as pioneers will pay off for them substantially as they develop the next phase of the marketplace. With the acquisition, we get the jokes. You know, Forethought and Microsoft — Microthought. So we said, 'Yeah, great products for small minds.'

Who else is jumping into desktop presentations?
Well, we were laughing about that the other day. There's a real distinction between the historical notion of business and presentation graphics, which has been dominated by data charting applications.

We believe that what people really wanted was a presentation system that allowed you to not only create but compose and manage complete presentations, including visuals and speaker's notes. I think there's going to be a lot of interest in that, and it's going to come from large corporations like Ashton-Tate and Lotus.

Is Microsoft prepared to take on this "missionary work?"
One of my assignments is to bring them up to speed — real rapidly — on what this missionary marketing needs to do, to leave them with the religion as well as the products. They are certainly capable of doing it and [are] more than committed to it, yes.

How will Powerpoint evolve?
The current version of Powerpoint will teach us what is the approximate level of integration needed. We put some straightforward tools for creating diagrams and illustrations in Powerpoint, and we may want to add to those. We put in a facility to be able to give a presentation, called the Slideshow Function, and we may want to enhance that. Certainly the introduction of the [Apple] Mac II and the new color standard needs to be fully exploited by the presentation marketplace.

One of the most frequently asked-for enhancements to Powerpoint at this early stage has been spelling checking. We're looking at some ways to link Microsoft products more closely to Powerpoint.

And now that Apple's Multifinder is out, people are going to run multiple applications simultaneously.

What is your business philosophy?
Well, we took an attitude in terms of development years ago that when we worked with outside developers, we wanted to be a value-added publisher. So, it was not a question of the traditional, 'they developed it, you publish it.' You know, good software is a lot more than just lines of code.

What is missing from software?
I think the technology business has been absolutely horrid in communciating to end users why they should go into stores and buy their products.

Do you expect competition to Powerpoint before year's end?
Software is a mystical beast. When a company starts to think that they're going to be alone in the marketplace, they fail in the marketplace. So, absolutely, there will be competition. It'll come before the end of the year, and it'll be substantial.

Lotus and Ashton-Tate?
Lotus has made a big investment in and [put] a lot of commitment behind Freelance Plus, and it's a fine product in the old generation. Whether they will introduce a Freelance-related product in the new generation of desktop presentations is undecided. Ashton-Tate? Almost the same strategy there. They acquired Decision Resources and the Master Series — fine products in the old generation.

What are your plans, post Forethought and Microsoft?
I'm going to take the first real vacation I've had in 12 years to do some cobweb cleaning in the corners of my brain and probably pursue some new opportunities in the spring.

In desktop presentations?
No. I have a very limited noncompete agreement that would make that very difficult to do.

Does that preclude you from helping Lotus in that area?
Geez, you know. Working for Lotus. What a concept! Big companies are big companies, and I kind of like small opportunities and small companies.

Will you stick with software?
The software business is exciting, dynamic, and it's exactly the place where technology comes face-to-face with real customers. I really enjoy it. It's funny, because I have either directly made or been closely associated with just about every mistake in the software business. I can't think of one fiasco I haven't made myself. I think there's at least a dozen mistakes left to be done.

The Newest Show

won't
be on TV...

Ideassociates ups PS/2 RAM

BY JAMES A. MARTIN
CW STAFF

BILLERICA, Mass. — Ideassociates, Inc. recently entered the IBM Micro Channel Architecture enhancement arena with the introduction of a 12M-byte memory board, which the company claimed provides the largest amount of add-on memory currently available for the IBM Personal System/2 series.

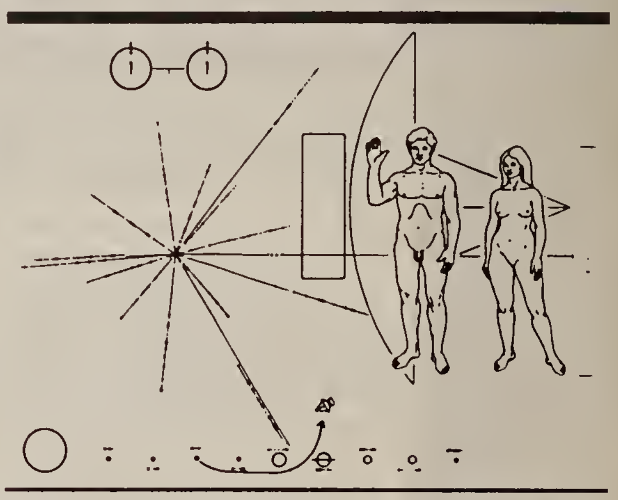
The Ideamax/MC board will reportedly enable users to add from 512K to 12M bytes of random-access memory (RAM) to PS/2 Models 50 and 60. Ideamax/MC and another introduction, Idea Supermax/MC, an 8M-byte card with a serial and parallel port, allow users to allocate up to 8M bytes of RAM as expanded memory and currently support the Lotus/Intel/Microsoft Expanded Memory Specification (EMS) Version 3.2.

The Intel Corp. 80286 microprocessor, around which the PS/2 Models 50 and 60 are built, can support up to 16M bytes of RAM. "You can take OS/2 to the limits with our board," said Mohammad Sehat, marketing specialist. However, until IBM and Microsoft Corp.'s OS/2 is released sometime in 1988, most demands for MCA memory cards are not expected to exceed 3M or 4M bytes.

"If you have applications that conform to EMS, or if you have a Unix operating system, you can use our board to access that memory," Sehat said. "But, practically speaking, most people wouldn't use more than 4M bytes right now."

Ideamax/MC will reportedly cost from $495 for a 512K-byte configuration to $7,395 for 12M bytes. Idea Supermax/MC's retail price will reportedly be $645 in the basic 512K-byte version, ranging to $5,145 for 8M bytes. Both are scheduled to be available this month.

Make Contact



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Drawing is from the plaque on the Pioneer spacecraft, 6 by 9 inches, gold anodized aluminum. Courtesy of NASA.
Trademark acknowledgement: Dow Jones & Co. (Dow Jones News/Retrieval), Mead Data Central (LEXIS/NEXIS), Tymshare Inc. (Tymnet), GTE (Telenet), Digital Equipment Corp. (VAX), International Business Machines, Inc. (IBM)

NEW PRODUCTS

Systems

A 20-MHz version of its **ALR386/220** family of Intel Corp. 80386-based microcomputer systems has been announced by **Advanced Logic Research, Inc.**

The basic configuration includes 10-MHz Intel 80287 support, 16-MHz Intel 80387 support, 1M-byte 32-bit random-access memory expandable to 2M bytes on the system board, a 1.2M-byte floppy disk drive, serial and parallel ports, eight expansion slots and a 101-key keyboard, the vendor said.

The basic configuration is priced at $3,495. Three other configurations are available ranging in price from $4,485 to $7,794.

Advanced Logic, 10 Chrysler, Irvine, Calif. 92718. 714-581-6770.

A personal computer-based turnkey system designed for the electronic archival, viewing, editing, printing and distribution of large engineering documents has been announced by **Cadscan, Inc.**

The system includes the vendor's Viewpack Raster Editing software and Cadscan Raster Scanning services. The scanning service scans engineering drawings up to 40 in. wide for use with the Viewpack software.

Viewpack, which runs under Microsoft Corp.'s MS-DOS, features instantaneous pan and zoom, mark-up and edit capabilities and hardcopy-output capabilities.

Pricing for an IBM Personal Computer AT-compatible microcomputer, 2M bytes of memory, a 30M-byte hard drive, a 1.2M-byte floppy disk drive, an IBM Enhanced Graphics Adapter color monitor, a Microsoft Mouse, Viewpack software, a turbo card and 50 scanned drawings is $10,995. The Viewpack software, a turbo accelerator card and 25 scanned drawings cost $4,995.

Cadscan, 505 Terrill Road, Scotch Plains, N.J. 07076. 201-322-9595.

Software applications packages

The *MAS Job Cost package*

An accounting software package designed specifically for the construction and specialized trade contractor industries has been announced by **State of the Art, Inc.**

The software, called **MAS Job Cost**, is said to integrate job costing with job-and-project estimating capabilities and billing features, providing a series of management reports at multiple levels. According to the vendor, users can customize the application without programming.

Features include a built-in Job Estimating submodule, a Job Billing submodule, project analysis reports, project variance reports, project profitability reports, change-order capabilities and exception reporting.

The MAS Job Cost package runs under Microsoft Corp.'s MS-DOS and Xenix. It costs $995.

State of the Art, 3545 Howard Way, Costa Mesa, Calif. 92626. 714-850-0111.

Apian Software, Inc. has introduced a personal computer-based productivity software package designed for line management applications.

The software, called **Decision Pad**, is said to combine elements of spreadsheets and rational decision theory into an interactive decision-making environment. It supports such situations as personnel selection and review, product line management, vendor evaluation and the comparison and assessment of alternative business strategies.

Sample templates are included for personnel, purchasing, product marketing, investment and sales presentation applications.

Decision Pad includes context-sensitive Help and a tutorial. It runs on any 256K-byte micro with Microsoft Corp.'s MS-DOS Version 2.0 or higher. It costs $195.

Apian, P.O. Box 1224, Menlo Park, Calif. 94026. 415-851-8496.

Software utilities

Version 5.0 of the **Microsoft Macro Assmbler**, said to support source-level debugging and mixed-language programming, has been announced by **Microsoft Corp.**

Version 5.0 supports the Intel Corp. 80386 and 80387 microprocessors. It also features DOS interface macros, high-level language-interface macros, the ability to assemble using all available personal computer memory and options that allow warning-level and define symbols to be set on the command line.

Also included are such utilities as a linker, an object module library organizer, an application rebuilder, a header modifier and a cross-referencer.

Microsoft Macro Assembler is priced at $150. Upgrades from Version 4.0 cost $40; upgrades from earlier versions cost $75.

Microsoft, Box 97107, 16011 N.E. 36th Way, Redmond, Wash. 98073. 206-882-8080.

Computer Associates International, Inc. has released a version of **The Spreadsheet Auditor** utility designed for its Supercalc4 spreadsheet application.

The Spreadsheet Auditor for Supercalc4 includes a macro debugging program that examines each macro, displays details on-screen and prints macro reports and a spreadsheet documentation program that allows for documentation of formulas and assumptions by allowing pop-up notes to be attached to any cell.

The Spreadsheet Auditor for Supercalc4 is priced at $99. It runs on IBM Personal Computers and Personal System/2s.

Computer Associates, 2195 Fortune Drive, San Jose, Calif. 95131. 408-432-1727.

Development tools

A data base management ssytem and applications environment for IBM Personal Computers and compatibles has been announced by **Revelation Technologies, Inc.**

Advanced Revelation offers an application development environment that includes a dictionary-driven DBMS, a programmer's tool kit and an application processor said to allow users to prototype, debug, build and modify applications without generating source code.

Advanced Revelation costs $950.

Revelation, 16th floor, 1180 Avenue of the Americas, New York, N.Y. 11036. 212-921-2288.

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Return to: World Congress on Computing
300 First Ave., Needham, MA 02194

A scientific and engineering software system for the IBM Personal Computer and Personal System/2 has been announced by **National Instruments.**

The software, called **Labwindows,** features an interactive environment and libraries for developing software for applications involving data acquisition, data reduction, data analysis, data presentation and instrument control. It supports application development using Microsoft Corp.'s C language and Quickbasic.

Labwindows is priced at $495. An optional add-on package with advanced graphics and data analysis libraries will be available in the first quarter of 1988 for $895.

National Instruments, 12109 Technology Blvd., Austin, Texas 78727. 512-250-9119.

Data storage

a 90M-byte internal disk drive for Apple Computer, Inc. Macintoshes has been introduced by **Jasmine Technologies, Inc.**

The Jasmine **Innerdrive 90/II** features a 16-msec access time and comes with 9M bytes of public domain software, shareware and backup software. It includes mounting bracket, cables and all other hardware necessary for installation.

The Innerdrive 90/II is priced at $1,499.

Jasmine, 555 De Haro St., San Francisco, Calif. 94107. 415-621-4339.

Printers/Plotters/ Peripherals

The **HP Paintjet** thermal ink-jet color-graphics printer has been announced by **Hewlett-Packard Co.**

The printer is said to produce color graphics for overhead transparencies and reports. It reportedly produces text and graphics with 180 by 180 dot/in. resolution and near-letter-quality text at a speed of 167 char./sec.

The printer holds four inks and can provide up to 330 shades and hues. It handles Z-fold or cut-sheet paper and single-sheet transparency film in either A or A4 sizes.

The HP Paintjet printer is priced at $1,395.

Hewlett-Packard, 1820 Embarcadero Road, Palo Alto, Calif. 94303. 800-367-4772.

An optical character recognition subsystem for Apple Computer, Inc.'s Macintosh has been introduced by **Microtek Lab, Inc.**

The subsystem, called **MacoCR,** is said to be capable of reading more than 250 type faces. It reads characters ranging in size from six to 12 points and also reads proportional, foreign accent characters and some typeset faces. According to the vendor, as the text is recognized, it is converted into Macwrite, Microsoft Corp. Word or plain ASCII text format for editing or incorporation into word processing software.

MacoCR is priced at $895.

Microtek Lab, 16901 S. Western Ave., Gardena, Calif. 90247. 213-321-2121.

Board-level devices

A numeric coprocessor card designed for the Intel Corp. 80386 chip has been announced by **Microway.**

The **MW1167** card fits in computers, such as the AT&T 6386, that come equipped with the Weitek 121-pin superset of the Intel 80387 socket. It can be used in conjunction with an 80387 and performs the basic floating-point operations in seven to 11 cycles.

It conforms to the IEEE standard for floating-point arithmetic. Functions provided include add, subtract, multiply, divide, conversion to and from 32-bit complement integers, absolute value and compare.

The MW1167 is priced at $1,495.

Microway, P.O. Box 79, Kingston, Mass. 02364. 617-746-7341.

A hardware-assisted software debugger called the **386/C Probe** has been announced by **Atron,** a division of Northwest Instrument Systems, Inc.

The 386/C Probe is said to feature the ability to do a qualified breakpoint, depending on which routine is accessing specific locations.

It reportedly has the ability to detect the specific occurrence of up to four events that occur in a specific real-time sequence.

The 386/C Probe also allows users to determine which data to save and which to ignore, according to the vendor.

The 386/C Probe provides source-level debugging for languages such as C and Pascal. It consists of a motherboard and a piggyback board.

Currently available for Compaq Computer Corp. 386-based PCs or compatibles, the 386/C Probe costs $3,995.

Atron, 20665 Fourth St., Saratoga, Calif. 95070. 408-741-1293.

Auxiliary equipment

A security device designed to prevent theft of portable and laptop computers has been announced by **Micro Security Devices, Inc.**

The **PC Guardian** Model 1000 is a 6-ft steel cable that attaches to the computer.

According to the vendor, the product retracts into a 4- by 4- by ½-in. steel housing.

The PC Guardian Model 1000 is priced at $99.95.

Micro Security Devices, 118 Alto St., San Rafael, Calif. 94901. 415-459-0190.

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Can you afford not to get the full story on the RM-4800, as well as the rest of the RM Series? Call today. Quantities are limited.

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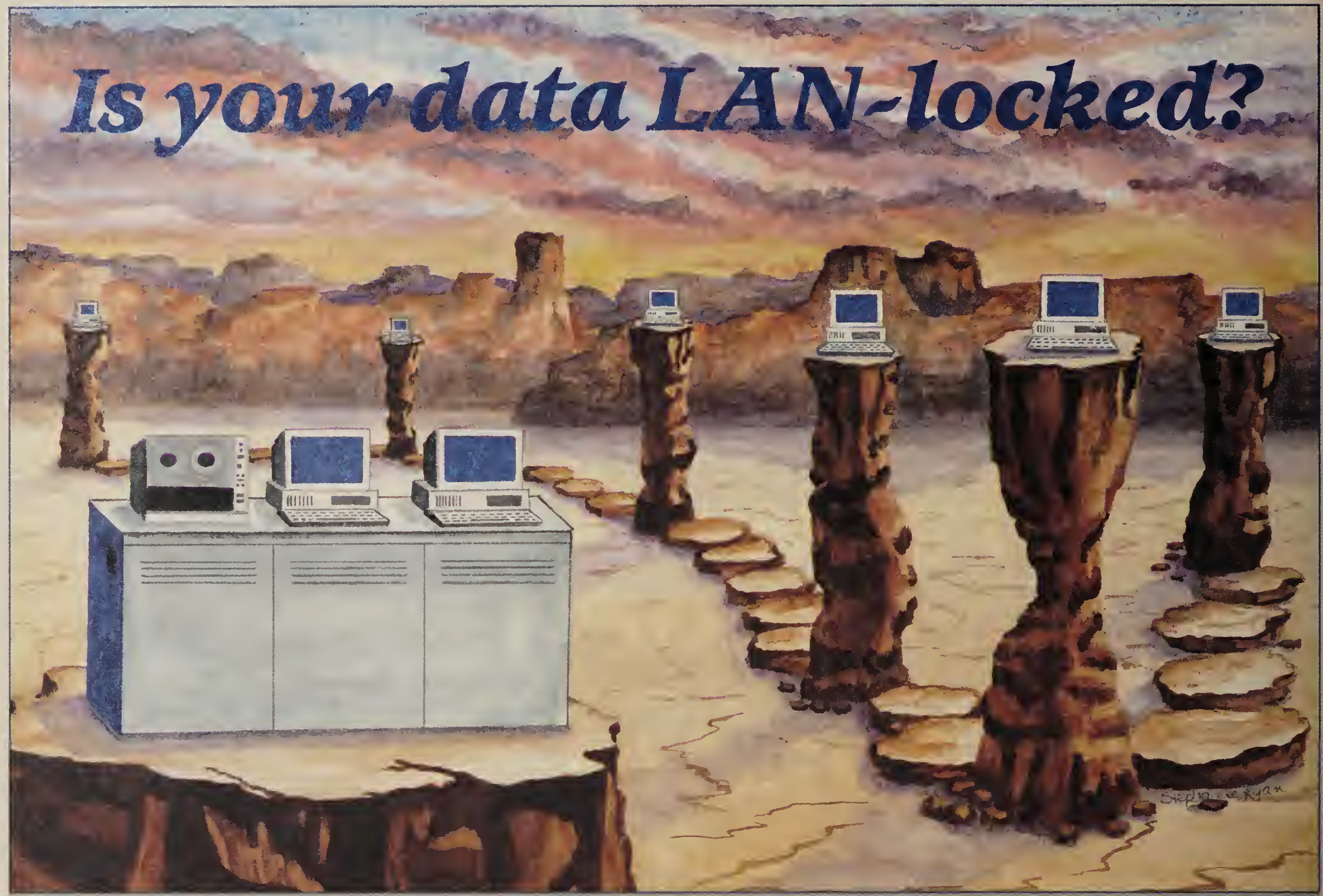
† 60-month lease rate. 36-month lease and purchase option also available.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Communication Networks

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January 25-28, 1988, Washington, D.C.

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Communication Networks '88
Conference and Exposition
January 25-28, 1988
Washington D.C. Convention Center

Communication Networks is a real-life success story. In fact, we're celebrating our 10th year as the world's leading voice and data communications conference. Year after year, thousands and thousands of communications professionals make it their business to attend. Our worldwide network of information, technology and people helps them succeed in their jobs and in their careers.

As part of the CN '88 network, you'll learn the latest developments in all aspects of voice, data and telecommunications, including equipment, services and software. Plus you'll learn the management and business communications skills you need to get ahead.

Four days are all it takes. Start with Communication Networks' comprehensive day-long tutorials, where you'll find answers to your questions and solutions to your problems. Then profit from three full days of conferences and exposition. Get practical tips from industry experts, check out new products and exchange ideas with your colleagues. All this and more under one roof — in the stimulating atmosphere of Washington, D.C.

Return to work with a fresh, creative perspective. You'll enhance your job performance, impress your superiors and meet the future with confidence.

Take advantage of CN's 10 years of experience and expertise. Register now, and make CN your network for success.

10 years with the industry's elite

Celebrating a decade as the industry's elite voice and data show

From the beginning, Communication Networks has brought together the industry's elite trendsetters to share their viewpoints and visions.

From opinion makers Howard Anderson and Harry Newton to technical futurists James Martin and Len Kleinrock, CN participants have included some of the most influential figures in communications.

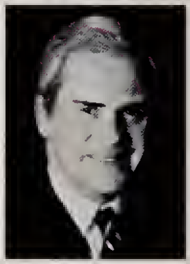
Drawing leaders such as AT&T's James Olsen, IBM's Terry Lautenbach and Contel's Charles Wohlstetter, CN also attracts such new entrepreneurs as Bruce Smith of Network Equipment Technologies.

The show attracts important policy makers, as well. Past participants have included FCC Commissioner Dennis Patrick, retired FCC Chairman Mark Fowler, NTIA Head Alfred Sykes and Senator Ernest Hollings.

The tradition continues

On CN's 10th anniversary, we continue our tradition of putting you in touch with key industry leaders. In that spirit, we're pleased to bring you a special keynote address by Fred Smith, chairman of Federal Express. Mr. Smith will examine the role of telecommunications in building profit and productivity.

In the days that follow, you'll hear from an impressive array of speakers from companies that are sure to leave their mark on the future of voice and data communications. As a wrap-up, Dr. Dixon Doll, founder of The DMW Group and a CN participant from the start, will discuss the next decade of telecommunications and what it will mean for you.



Smith

Doll

the success

Here's what you'll get at CN '88:

Improved job knowledge and management skills

Pick up information that will help you make smarter business decisions. Learn how to evaluate new technologies and procedures and make cost-effective choices. Develop new management skills to increase your efficiency and help you get ahead.

Admission to the industry's top expo

CN continues to attract an impressive list of exhibitors. This year, about 1,300 booths will fill almost 300,000 square feet in three spacious exhibit halls. It's a great opportunity to get a firsthand look at how specific products relate to your particular concerns.

Unsurpassed learning opportunities

Take advantage of Communication Networks' comprehensive, day-long tutorials on a range of important topics, and receive CEU credit. Taught by telecom industry experts, these superb tutorials are an ideal prelude to three days of conferences and expo. The conference sessions, led by the industry's key players and leading authorities, provide new insights and help you make the most of the time you spend with exhibitors.

An exclusive look at new products & technologies

Exhibitors have made it a tradition to introduce their latest products at Communication Networks. Discuss and evaluate new offerings during the CN '88 conferences, then see close up what they can do for you.

Practical solutions to your problems

Get expert advice based on real experience. Bounce your ideas off leading telecom professionals and discover innovative ways to solve problems and create opportunities. Learn how to make the equipment you have do even more.

A chance to meet your peers

Confer with colleagues from all over the country. CN '88 will attract more than 17,000 attendees who'll be eager to share ideas and experiences, while making valuable professional contacts.

Prepare for the future

Learn how to anticipate change and be ready for it. Get practical advice on how to adapt current equipment and procedures to keep up with evolving technologies and requirements.

Exceptional attendee services

Your visit to CN '88 will be productive and pleasant. We'll help you get around the city easily, assisting you with taxis, the rapid transit METRO, hotel shuttle buses and airport transportation. And with our full-service message center, keeping in touch with your office will be a snap.

Check this list ... then register to attend!

Whatever your function or responsibility, Communication Networks has much to offer. If your job is on this list, CN '88 is meant for you:

- Top managers who would like to improve telecommunications and network capabilities
- Corporate communications, telecommunications and network managers and directors
- Communications planning managers
- DP/software managers, analysts and programmers
- Systems engineers and engineering managers
- Communications systems managers and designers
- Office systems managers and analysts
- Product development and business planning managers
- Communications coordinators, operators and technicians
- Scientists, engineers and engineering managers
- Communications analysts, specialists and programmers
- Operations, maintenance and installation supervisors and managers
- Sales and marketing executives and managers

Improve your business and your ca

The CN '88 In-depth Tutorial Program

Monday, January 25
9:30 am - 5:30 pm

Known for its exceptional tutorial program, CN offers the most comprehensive all-day sessions in the industry. Meeting face-to-face with communications innovators and leaders, you'll get in-depth information and advice in areas vital to your organization and your job.

Learn from the experience of top professionals, then ask questions of your own. They'll help you solve your specific problems, show you how to meet new challenges and give you a new perspective. What's more, your newfound knowledge will help you make the most of the CN '88 conference program and expo which follow.

Choose the tutorial that's right for you

Whatever your experience or responsibilities, CN '88 has a tutorial to suit your particular needs. Rated introductory, intermediate or advanced for easy selection, each session examines a different aspect of the communications industry. And each qualifies you for Continuing Education Credits.

Choose the tutorial that will benefit you the most. Better yet, take advantage of more than one by bringing along some of your colleagues and pooling all your new ideas.

T-1 Planning Integrated Corporate Networks

Leader: Dr. John McQuillan, President, McQuillan Consulting

This seminar offers an in-depth analysis of the issues involved in planning network strategy. Coverage of network integration includes enterprise networking, new bandwidth intensive applications and the bundling of all corporate information needs into one strategic entity.

Level: Intermediate

T-2 Multivendor/Multi-architecture LANs: Making Them Work

Leader: Dr. Kenneth Thurber, President, Architecture Technology

The complexity of today's LAN environments springs from the need to connect a diverse range of network elements in an effective, manageable form. This advanced seminar addresses these issues in detail and suggests specific ways to achieve this goal.

Level: Advanced

T-3 ISDN: Standards, Products and Services

Leader: James G. Herman, Director, Telecommunications Consulting Group

ISDN standards have yet to meet universal acceptance. This highly focused, intense session examines these emerging standards in the context of vendor trials, current disagreements and the products and services that will soon be offered.

Level: Intermediate

T-4 Multivendor Network Management

Leader: Jerry McDowell, Vice President, Vanguard Telecommunications Inc.

In an age of deregulation, network managers often find multiple carriers on the same circuit, along with a mix of hardware and software from various vendors. This seminar looks at the problems inherent in a multivendor network, and suggests tools and methods to solve them.

Level: Intermediate

T-5 How to Become a Better Telecom Manager

Leader: Gerald P. Ryan, President, Connections Telecommunications Inc.

Today's telecommunications manager must not only keep on top of fast-changing technologies and standards but must also act as network engineer, financial analyst, corporate communicator, paralegal, trainer and counselor. This seminar provides a lighthearted, instructive look at how to develop the skills, organization and thought processes managers need for maximum efficiency.

Level: Intermediate

T-6 The Latest Look at Network Standards and OSI

Leader: Harold C. Folts, Executive Director, OMNICOM Inc.

OSI and other existing standards provide valuable direction in architecture and product development. The emergence of newer standards will likewise have a strong effect on the industry. This session examines major standards in light of their purpose, significance, application and technical elements.

Level: Introductory

eer with the best tutorials anywhere

T-7 Modeling/Designing Voice and Data Networks

Leader: Dr. Wushow Chou, Professor of Computer Science and Electrical and Computer Engineering, North Carolina State University

This advanced seminar offers detailed, practical instruction on how to design integrated networks. Coverage includes combining voice and data on a single architecture to maximize wideband service efficiency, the mitigation from classical multipoint to distributed systems, examination of cost-efficiency issues and more.

Level: Advanced

T-8 NetView: Industrywide Implications

Leader: Atul Kapoor, Vice President, Kaptronix Inc.

This detailed analysis of the meaning and significance of IBM's NetView and NetView/PC includes a look at their operation, technical specifications, dependencies and functional interactions. Discussing NetView's impact on the industry and on users, this seminar offers practical suggestions for its implementation.

Level: Intermediate

T-9 Open Network Architecture: Carrier/Vendor/User Implications

Leader: Haines Gaffner, President, LINK Resources Corp.

To stimulate competition in enhanced data processing services on public switched networks, the FCC has ordered AT&T and the RBOCs to move quickly into ONA. Examining the details of the FCC ruling and its implications for services offered, this comprehensive session also provides an overview of the key players.

Level: Intermediate

T-10 International Networks: Solving the Practical Problems

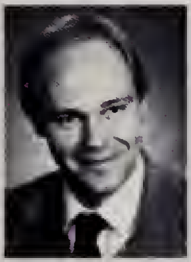
Leader: Len Elfenbein, President, Telecom Systems Group Inc.

The growing number of U.S. corporations expanding their networks overseas are encountering confusing regulations and tariffs, lack of consistency among countries and serious delays in ordering and installing service. Exploring these issues, as well as the role of the PTTs, this lively seminar offers information and advice on how to deal successfully with the players, rules and practices of international networking.

Level: Intermediate

T-11 Building the Network Control Center

Leader: Gabe Kasperek, President, Kazcom Inc.



This "how-to" seminar on how to manage a network control center covers the functions that are necessary, the tools and systems that work best and ways to put it all together in order to meet realistic, day-to-day network control needs.

Level: Introductory

T-12 Regulatory Issues and Answers

Leader: Richard E. Wiley, Senior Partner, Wiley, Rein and Fielding

The ever-growing complexity of regulatory and technical environments demands a thorough grasp of legal, social and regulatory issues, and of vendor technology and industry standards. This well-balanced, thoughtful session addresses key issues and developments expected in the coming regulatory year.

Level: Intermediate

T-13 Introduction to Data Communications

Leader: Gary Audin, President, Delphi Inc.

This highly regarded, annual seminar offers data communications novices a perfect blend of concept, technology and application. Taught by a noted industry expert, the session provides excellent course notes that will serve as valuable reference material.

Level: Introductory

T-14 Introduction to Voice Communications and PBX

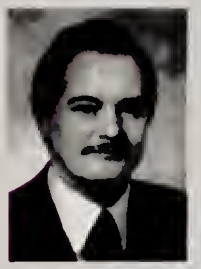
Leader: James Morgan, Principal, J.H. Morgan Consultants

Telecommunications managers need to know the fundamentals of both data and voice communications. This seminar provides a thorough foundation in voice communications, including technology, PBX characteristics, switched networks, tariffs and services, along with an overview of traffic engineering.

Level: Introductory

T-15 Impact of the New Post Divestiture Tariffs on Large Networks

Leader: Robert L. Ellis, President, The ARIES Group Inc.



The divestiture of AT&T has changed the rules for designing large networks. This session examines the structure of post-deregulation tariffs, including January 1988 revisions. Covering such topics as LATA-pure strategy and the economics of data network configuration, the course also offers guidance in pricing, configuration and how to use federal access tariffs.

Level: Intermediate

1988 ... an important milestone in c

This year, we're celebrating much more than just the 10th anniversary of Communication Networks. That's because 1988 also marks 20 years since the Carterfone decision, as well as 5 years since the AT&T divestiture — two events that have transformed the communications industry.

Perhaps the first step toward divestiture, the Carterfone decision paved the way for users to purchase their own equipment and create their own networks. This era of change set the climate for the first Communication Networks conference and exposition in 1979.

In the years following CN '79, divestiture created even more changes, and more than a few headaches, too. Of course, some issues, regulation, for example, never seem to fade.

It's been an evolutionary process for the communications industry. And Communication Networks has helped set the pace. That's why, after a decade, we're the premier communications network show.

10

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Registration Form

Yes! I'd like to make CN '88 my network for success.
Please register me for the following:

☐ **All four days at CN '88.** My registration includes the In-depth Tutorial (Jan. 25) indicated below and full admission to the three-day Conference and Expo (Jan. 26-28), including seminars and exhibits.

Reserve space for me in this tutorial:
T-__________ **$695.00**

☐ **The three-day Conference and Expo** (Jan. 26-28) **$495.00**

☐ **The all-day In-depth Tutorial** (Jan. 25) indicated below. My registration also includes admission to the Expo (Jan. 26-28).

Reserve space for me in this tutorial:
T-__________ **$295.00**

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Tues. Wed. Thurs. ... **$195.00**
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☐ **The Expo at CN '88** (Jan. 26-28). In order to receive your exhibits-only badge, you must fill out the form. No calls, please .... FREE

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To register additional people, copy this form. For group registration, call (800) 225-4698.

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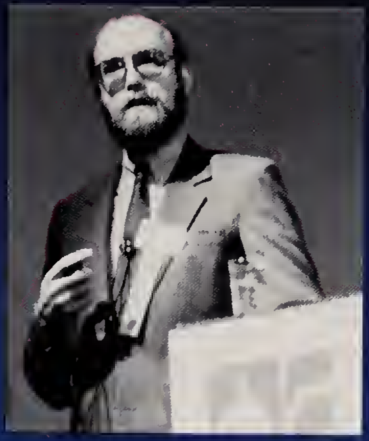

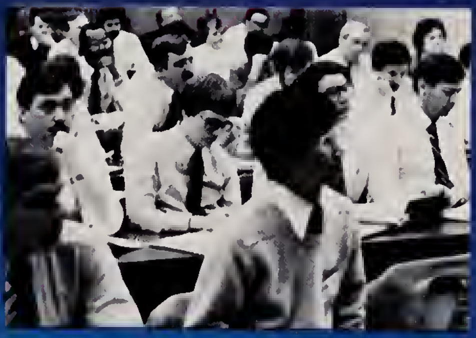

Keep pace with a fast-moving indus

The CN '88 Conference Program

Tuesday - Thursday, January 26 - 28

Designed to keep you on top of new trends and technologies, the CN '88 conference program is a highly effective learning forum. Led by some of the most respected professionals in telecommunications, the sessions offer solid information and instruction.

Armed with information on the latest technological developments, regulatory issues and management techniques, you'll meet the coming year with more knowledge, more insight and more confidence. And that's sure to pay off when it comes to your career.

Your choice of 10 program clusters

Drawn in large part from requests made by previous attendees, the seminar topics are those you'd like to hear. Over 75 hour-long conference sessions are organized in 10 program clusters that focus on specific areas of interest. So it's easy to study the aspects of the industry that concern you the most. Choose the sessions from the clusters that suit you best.

Washington Regulatory Scene

The industry's most important forum on communications policies and regulatory issues. Learn how to deal with current and future regulatory trends.

- The Washington Scene: The Year Ahead in Telecommunications Policy
- Restructuring the Telecom Industry
- Federal/State Regulations: The Joint Board Process
- 1998: The Next 10 Years in Telecom Policy
- Bypass and Access Charges
- Open Network Architecture
- New Theories of Carrier Regulation from Deregulation to Social Contract
- Telecommunications Regulation and International Trade

New Product Review

Information on how specific new products can help you achieve your goals. Seven sessions help you put new product options into perspective.

- What's New in T1
- Next Generation Packet Switches
- PC Networking Products and Software
- IBM New Product Review
- Low Cost Switches and Multiplexers
- LAN Gateways and Bridges
- NetView Compatible Products

Network Planning and Design

Step-by step guidance in how to meet specific network requirements. Get detailed solutions from the experts.

- Optimizing Network Switching Node Locations
- Designing Distributed X.25 Type Networks
- Designing Traditional Multipoint Networks
- Designing Networks Using Local Exchange Carriers
- Combining Voice and Data Services in an Integrated Network
- The Tariff Shopping Issue

Network Diagnostics and Management

Practical evaluations of various products, systems and strategies. Find out which work best for you.

- Troubleshooting Outages in a Multicarrier Environment
- Network Integrity
- Security Issues
- The Integrated Network Management System
- Network Inventory/Changes Management Systems
- Controlling Highly Distributed and Packet Networks
- Diagnosing Troubles on T1 Networks
- The Operation of Shared Voice and Data Networks
- Controlling International Networks
- Using NetView: A Practical Case Study Perspective
- Monitoring Network Performance
- Designing Networks with High Performance Expectations
- Function and Use of Electronic Matrix Systems

try ... and move ahead in your career

Voice Networking Issues

How to get the most out of voice services. Study various technologies and learn how to manage them.

- Adding Data to Voice Networks: Performance and Operational Issues
- Third Party PBX Maintenance
- Centrex Services
- Software Defined Networks and Tandem Networks
- Digital PBXs
- T1 Services

International Issues

The ins and outs of international networks. Discover strategies for dealing with challenges unique to the international arena.

- Understanding and Optimizing International Circuit Costs
- Competing in Japan
- ISDN Around the World

Technology Briefing

Detailed updates on advanced technologies presented by leading researchers. A high level of technical knowledge is required.

- Expert Systems
- Speech Recognition — When Can I Buy a Voicewriter?
- Superconductors
- Supercomputers and Minisupercomputers
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NETWORKING

DATA STREAM

Clare Fleig

Internal IBM net sees light

In 1974, IBM introduced its Systems Network Architecture (SNA), a set of communications guidelines, procedures and products created in response to users' demands for distributed data processing. Over the next 13 years, IBM progressively enhanced SNA to meet demands for more network flexibility, processor compatibility and a range of other issues — all the while maintaining complete allegiance to the SNA concept.

While SNA may be the network of choice for IBM's public persona, IBM is privately committed to a completely different approach. The internal IBM network, known as Vnet, currently connects more than 2,000 processors at more than 225 IBM sites worldwide. Unlike its SNA counterpart, Vnet is a fully distributed processing network based on VM.

Since its inception, Vnet has provided IBM internal users with peer-to-peer networking and the distributed processing capabilities that are just now beginning to be realized in traditional SNA.

What makes Vnet interesting for users today is that in the last few months, elements of the Vnet approach have been progressively making their way

Continued on page 57

OSI security system revealed

NSA, NBS, consortium of vendors teamed up on net specifications

BY ELISABETH HORWITT
CW STAFF

BALTIMORE — The National Security Administration (NSA), the National Bureau of Standards (NBS) and a consortium of 12 communications and computer vendors unveiled the framework for an Open Systems Interconnect (OSI) networking security system at the National Computer Security Conference, held here recently.

The Secure Data Network System (SDNS) project was initiated by the above organizations in August 1986 to develop specifications for cost-effective, transparent, computer-independent communications within OSI, according to a presentation given at the conference by BBN Communications Corp. The fruits of SDNS will be submitted for inclusion in the Government OSI Profile, a set of protocols that the U.S. Department of Defense plans to use in its OSI networks.

While the government plans to reserve some elements of SDNS, such as cryptographic algorithms, for its own use, approximately 80% of the specifications will be publicly available, according to Dennis Branstad, a senior computer scientist at the NBS Institute for Computer Sciences and Technology.

Among the vendors involved

Continued on page 58

Survey: Voice/data integration ranks high

BY ELISABETH HORWITT
CW STAFF

While the majority of top corporate telecommunications executives deal with both voice and data communications, lower level employees within those departments are often assigned to either all-voice or all-data operations, according to a recent member survey by the International Communications Association (ICA).

The national users organization interviewed telecommunications personnel from the top executive position, which typically carries the title of director of telecommunications, down five levels to technicians and low-level managers. Almost 60% of the executives reported dividing their time equally between voice and data communications activities, with only 7% reporting time spent exclusively on one or the other (see chart at left).

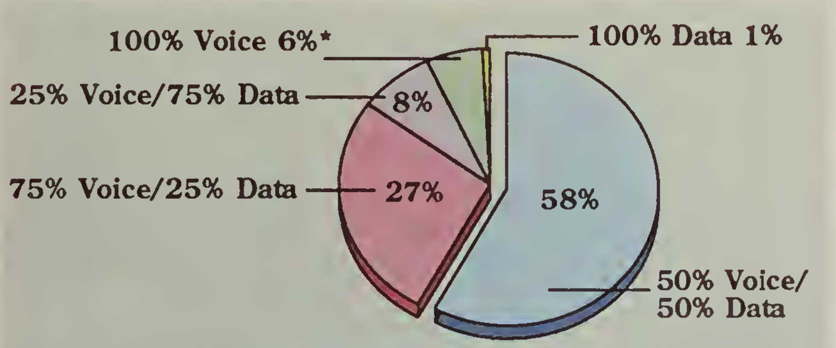
Work content, averaged across all job levels, was 25% all-voice and 23% all-data, with the remainder of the respondents responsible for a combination of voice and data in different proportions. Approximately 65% of the managers said they deal with both voice and data, with 23% responsible for just voice.

Of junior analysts and techni-

Continued on page 58

Job content

Voice and data responsibilities of International Communications Association members at the level of vice-president or director



*Segment of pie indicates percent of members whose division of responsibilities reflects ratio

INFORMATION PROVIDED BY THE INTERNATIONAL COMMUNICATIONS ASSOCIATION
CW CHART

Partners disband MAP firm

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — Ungermann-Bass, Inc. and General Electric Co. last week dissolved their partnership in the floundering Industrial Networking, Inc. (INI) and announced that GE has exchanged its 36% interest in INI for a 3.2% stake in Ungermann-Bass.

GE also has the option to purchase an additional 3.6% interest in Ungermann-Bass during the next four years. The two vendors will continue to work together to pursue joint marketing opportunities.

"I would say that Ungermann certainly struck a good deal," said Mark Stahlman, a research analyst with Sanford C. Bernstein & Co. in New York. "But the point to stress is GE's partnership with Ungermann and that the financial terms are less important to GE than the even-

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Inside

- FTP Software claims big performance, small price for LAN analyzer. Page 56.
- Bridge spans disparate LANs across X.25 packet-switched links. Page 57.
- AT&T designs digital voice terminal for System 75, 85 PBXs. Page 59.

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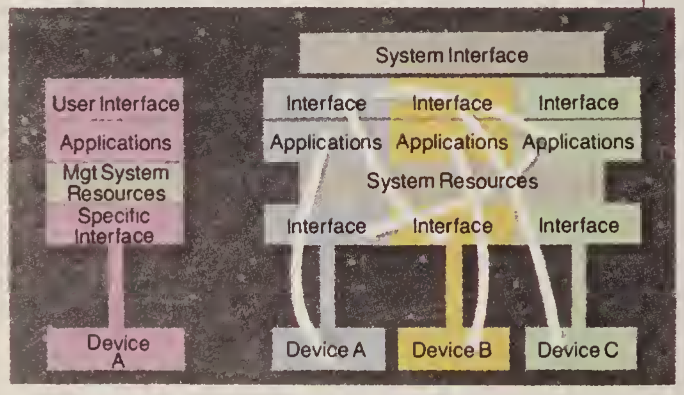

When your network is simple, so is managing it. But when it grows with multiple technologies, most network management systems simply run out of steam.

To get maximum network performance in these complex environments, a new level of integration is required. Which requires a new concept. One that allows you to address current network management needs, yet ensures you of optimum control over your network, no matter how complex it may be, or may become in the future.

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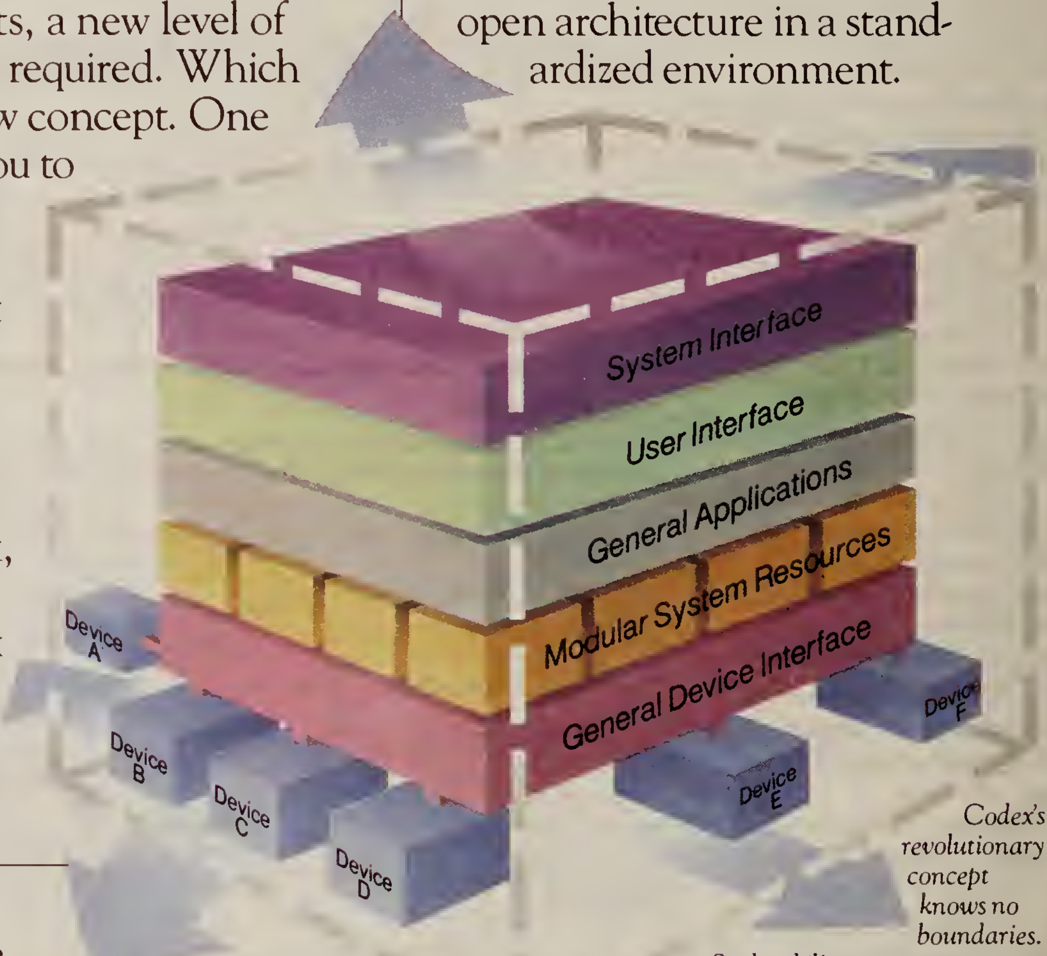

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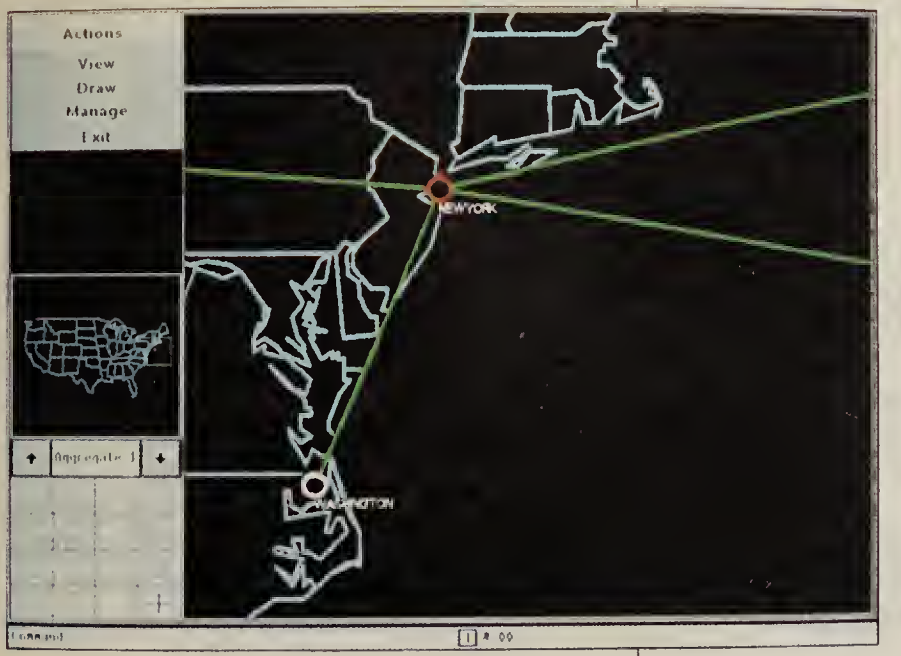

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Analyzer claims full diagnostics, low price

BY ELISABETH HORWITT
CW STAFF

BOSTON — A low-end local-area network (LAN) analyzer introduced recently by FTP Software, Inc. reportedly provides most of the network packet and protocol diagnostic capabilities offered by more expensive products at less than one-tenth the price.

Lanwatch software converts an IBM Personal Computer into a diagnostic workstation that can capture network packets in real-time, display them and store them for printout or later analysis, according to FTP's vice-president of sales and marketing Roger Greene.

In Display mode, each line on the screen shows information about an individual packet, including headers and trailers, the type of information requested, destination and source addresses and whether the same packet had to be sent multiple times.

A filter feature allows Lanwatch to monitor only packets that are of interest to the user; for example, only packets originating from a particular node or only packets with Digital Equipment Corp.'s Decnet headers.

Imaging software firm Mathematica, Inc. in Lakeland, Fla., uses Lanwatch to diagnose Ethernet communications problems between personal computer-based workstations and a proprietary minicomputer, according to the company's president, Cecil Thornhill.

'Blindman's buff'

"Before, we were playing blindman's buff, trying something out to see if it fixed the problem," he noted. "With Lanwatch, we could freeze a variety of communications transactions and watch a crash in slow motion to see exactly what packets coming from the PCs were making the mini go schizoid." Mathematica is also recommending Lanwatch to clients as an overall monitoring tool, "so that when you hang new systems on the network, you can figure out what has gone weird."

Lanwatch does lack some capabilities that are provided by high-end LAN analyzers, Greene noted.

Special-purpose hardware used by Excelan, Inc.'s Lanalyzer, Network General Corp.'s Sniffer and Hewlett-Packard Co.'s products can catch most packets that go over the network, he explained, while the PC-based Lanwatch will miss some packets, particularly on networks with high-volume traffic. This is not a critical problem "for a lot of people who just want an idea of how the network is operating," Greene said.

Lanwatch functions well as a troubleshooting device to pinpoint problems on a congested network, according to Greene. But when it comes to collecting network statistics, the device works better on low-use LANs, he admitted.

Priced at $1,200, the product currently runs on most Ethernet network interfaces. FTP plans to add support for the IBM Token-Ring and possibly the Starlan networks, Greene said. It is available for immediate delivery for boards from Excelan, Micom Systems, Inc. subsidiary Micom-Interlan, Inc. and 3Com Corp.

Telemail adds batch transmission

BY ELISABETH HORWITT
CW STAFF

RESTON, Va. — Telenet Communications Co. has announced Telemail 3780, a batch capability that allows customer hosts to collect multiple user messages in 3780 batch mode from the Telemail electronic messaging service. This provides significant cost savings over the existing Telemail service, which does not provide batch transmission, Telenet said. "It's a cost-effective way to send multiple messages to and from a user host," a Telenet spokeswoman explained.

The service targets securities/brokerage houses, banks and insurance companies that need to make large quantities of information available to multiple customer or company sites, Telenet said.

One customer, an insurance firm that did not want to be named, plans to have underwriters send their queries about customers' claims histories to a Telemail electronic mailbox.

Telemail will then send batches of these queries to the insurance company's host, which will perform data base searches to answer the queries. The answers will then be sent back in batch mode to the Telemail mailbox for underwriters to pick up.

While 3780 batch mode was originally developed by IBM, a number of other computer vendors, including Digital Equipment Corp., Data General Corp. and Wang Laboratories, Inc., also support the protocol, the Telenet spokeswoman said.

Telemail 3780 can deliver messages to an electronic mailbox or via Telemail Telex to a telex device or via Telemail Xpress to a print site.

There are no connect-time or access charges for Telemail 3780. Transmission charges are 20 cents per kilocharacter between 7 a.m. and 6 p.m.; 14 cents per kilocharacter between 6 p.m. and 9 p.m.; and 12 cents per kilocharacter between 9 p.m. and 7 a.m.

Our LAN-Gateway runs 56Kb.

At 56Kb, RabbitGATE™ is the fastest 3270 and RJE remote host connection for NETBIOS LANs around. Which, in itself, is something you may not require. But isn't it nice to know you'll be able to run that fast when your needs change? And more important, it's good to know RabbitGATE outperforms the competition no matter how fast—or slow—you drive it, in either BSC or SNA.

For starters, RabbitGATE has its own onboard dedicated 80186 processor and 512k of RAM. Which is why its high speed is not limited by the PC. It also means the only gateway function required on the PC is for actual access to the LAN. So when compared to other gateway products, which downgrade your workstation into a dedicated controller, RabbitGATE can save up to 50% of your workstation's processor and RAM.

You'll also find RabbitGATE easy to use. Installation and configuration takes less than 30 minutes. As opposed to hours for the competition. In fact, initial installation and start-up is so easy, most people don't ever open the user guide.

And speaking of users, RabbitGATE allows any end-user to individually customize the keyboard—doing so simply, without technical support. Then, only one DOS command is used to run the product. And, by the way, help for first-time or infrequent

IBM net

FROM PAGE 53

into mainstream SNA. This shift is an indication of IBM's difficulty in making the transition from the hierarchically based SNA to a peer-based SNA and an acknowledgment of the strength and flexibility of the Vnet design.

Vnet, introduced in 1975, provides the foundation for a decentralized communications environment based on IBM's VM that disregards many of the hierarchical rules in SNA. Vnet can handle distributed data functions across IBM's processor range with data transmission capacity at T1 speeds.

In addition to basic direct and remote-processor attachments, Vnet provides graphics and test processing services for devices that include 200 picture-element (PEL)/in. printers and 1,400 PEL/in. photocomposers. A range of editing and text processing tools are also part of the Vnet's network services, including the Generalized Markup Language (GML) as well as editing and text processing tools including Xedit, PE and Script.

It is this kind of network functionality — already in place inside IBM — that IBM is now prepared to offer to end users. The integration of Vnet elements into standard SNA is already occurring. Vnet-based products that have already begun to appear commercially include Transparent Services Access Facility (TSAF), introduced with the 9370 Information System in October 1986, and the programming language REXX, available commercially since 1983.

TSAF provides workstations with a common data view across up to eight 9370s. REXX, which includes elements drawn from Pascal and PL/I languages, is the most commonly used programming language within IBM. It should come as no surprise that REXX is fully supported under the Systems Application Architecture complex.

Commercial implementation of Vnet continued in August with the introduction of a PC version of the GML, a document creation, editing and text processing tool.

IBM's commercial implementation of Vnet architecture is occurring now because of the changes in the computing environment that demand better options in connectivity than are available from SNA today. In addition, with companies like DEC, AT&T and others providing viable communications alternatives to SNA, IBM no longer has the time or the head start to invent a new network approach. Vnet is a proven technology that IBM can implement far faster than it could a system built from scratch.

Commercial implementation of Vnet is part of the larger trend within IBM of using products developed prior to the introduction of the 370 series. REXX, relational data base management systems and distributed processing were originally concepts floated during the 1960s from IBM's Future Systems Division.

While certainly a trend within IBM, the integration of Vnet into mainstream SNA is not likely to result in the replacement of SNA with a VM-based network. Instead, IBM can be expected to merge elements of Vnet with SNA to both preserve the SNA installed base (which numbers more than 25,000 sites) and provide a migration path for users toward the fully distributed processing network represented by Vnet.

Fleig is director of systems research specializing in local-area networking and IBM communications for International Technology Group in Los Altos, Calif.

Bridge connects varied nets via X.25 gateway

MOUNTAIN VIEW, Calif. — Bridge Communications, Inc. last week announced what it claims is the first gateway to connect different types of local-area networks (LAN) across CCITT X.25 packet-switched links. The product targets companies with LANs at multiple sites whose intersite traffic cannot justify dedicated T1 links, the vendor said.

The GS/1-IP Gateway Server provides a hookup to commercial X.25 networks for a wide variety of LAN types, including coaxial or fiber-optic-based 10M bit/sec. Ethernets that meet the IEEE 802.3 standard; the Bridge 5M bit/sec. Ethernet; and 4M bit/sec. token-ring networks that comply with the IEEE 802.5 standard. Networked systems communicate over the gateway using the Transmission Control Protocol/Internet Protocol (TCP/IP).

LAN workstations using TCP/IP can also use the gateway to talk with hosts directly connected to an X.25 network, provided the hosts are also running TCP/IP, Bridge said.

The GS/1-IP's ability to connect different types of LANs facilitates intersite communications for companies with hybrid networking environments, Bridge said. For example, an IBM Personal Computer on a token-ring network can access either an IBM 9370 or Digital Equipment Corp. VAX on a remote Ethernet network via an X.25 link.

Offering support

IBM recently announced TCP/IP support for the IBM Token-Ring network.

Based on a Motorola, Inc. 68020 microprocessor, the GS/1-IP is said to support up to eight communications ports, each of which can handle data rates from 1,200 to 64K bit/sec.

Available now, the GS/1-IP is priced at $10,500, with an additional $2,000 software license fee. This price includes an X.25 interface and one LAN interface. Up to four additional LAN interfaces can be added at a cost of $2,500 each.

But speed isn't everything.

users is always just a single keystroke away.

As if saving you time and memory wasn't enough, RabbitGATE also saves you money. It's priced competitively, yet offers unique features like a built-in windowing capability, 8 host sessions per workstation, and true concurrent operation of all active sessions. It even allows you to simultaneously talk to different hosts with different protocols from anywhere on the LAN.

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Voice/data

CONTINUED FROM PAGE 53

cians, 33% dealt with data only while 37% dealt with voice only, leaving less than a third responsible for both areas.

According to the survey, top-level executives' average salaries increased from $60,200 in 1985 to $64,900 in 1986. Managers' average salaries increased from $45,800 to $49,500, senior analyst/engineers' salaries rose from $33,400 to $36,000, and junior analyst/technicians' salaries increased from $19,700 to $21,600.

Telecommunications category

New to this year's survey was a section dealing with specialization within telecommunications jobs. Of the total sample of respondents, 47% reported specializing across multiple areas such as administration, billing, design, implementation, maintenance, marketing and operations. A focus on administrative tasks was more predominant in higher level jobs; lower level positions tended to focus more on billing.

A strong majority — 73% of all respondents — said the primary source of their telecommunications training was on-the-job training and promotion through the ranks at user companies. This applied equally to all job levels, the ICA said.

The survey also found that in 1986, 70% of all telecommunications functions reported to the DP/MIS department. This is a significant jump from the ICA's 1984 survey, in which only 50% of the respondents said they reported to DP/MIS.

OSI system

CONTINUED FROM PAGE 53

in the project are AT&T, BBN, Digital Equipment Corp., IBM, Xerox Corp., Unisys Corp., Wang Laboratories, Inc. and Honeywell, Inc.

"The first public unveiling of the basic building blocks of SDNS" at the conference gave financial institutions and other security-conscious users their first chance to evaluate the specifications' progress and allowed vendors that are not part of the project to start building the specifications into their products, Branstad noted.

The SDNS security system will incorporate encryption, access control through user and network component identification and device authentication, Branstad said. NBS, IBM, Xerox and DEC are jointly working on an SDNS project to develop a transport-level protocol that would provide security independent of how — and over what medium — a transmission is routed, Branstad added. A second SDNS team is working on security protocols for the OSI X.400 Message Handling System.

The National Bureau of Standards, or NBS, reportedly hopes to synchronize the SDNS effort with the NBS-sponsored OSI Implementors Workshop, a group of vendors that meets regularly to discuss what specifications should be included in commercial OSI products.

The OSI-based security products should become commercially available within the next two to three years, said Branstad, who chairs the Implementors Workshop.

Partners

CONTINUED FROM PAGE 53

tual success of INI and Ungermann."

INI, a joint venture formed in 1984 to develop industrial networking products based on the Manufacturing Automation Protocol (MAP) standard, will be absorbed within Ungermann-Bass. INI's consolidation in Ungermann-Bass really began during an August reorganization that included the reassignment of Joseph Schoendorf, who was president and chief executive officer of the INI subsidiary but was shifted to a strategic planning post.

In an August interview, Ralph Ungermann, president and CEO, admitted the joint venture had taken off more slowly than anticipated [CW, Aug. 31]. The blame lies not with INI but with events outside that company's control, Stahlman said.

"It's been a disaster," said Richard Kimball, an analyst with Montgomery Securities in San Francisco, "because their biggest customer, GM, has not been buying product." General Motors Corp. pulled the plug on its automation expenditures last year after realizing the money being spent would not provide as quick a return on investment as originally thought, Stahlman explained.

Buyer reluctance

A second critical factor, inhibiting the MAP market as a whole, is a reluctance among users to purchase the current MAP Version 2.1 because Version 3.0 is due out next year, both analysts agreed. Stahlman lauded the recent decision by the MAP/TOP Users Group [CW, Sept. 28] to freeze Version 3.0 for six years.

The MAP business is expected to grow to between $50 million and $70 million this year. In fact, it is probably closer to $20 million to $30 million, Stahlman said.

To compensate for slower sales, Ungermann said in the August interview that the firm was "reallocating resources to more profitable areas of business," but added it was still committed to the MAP venture.

"INI will resurface. It has probably the best positioning in the MAP market to take advantage of when the business reaccelerates," Stahlman predicted.

NEW PRODUCTS

Local-area network hardware

A packet-switch distributed network called **Starbus** has been announced by **ACI**.

According to the vendor, Starbus runs over one pair of standard telephone wires and can expand from two to 500 users in increments of one. It employs polled packet switching to allow for connections between any asynchronous device with an RS-232 port in any topology over one pair of standard twisted-pair telephone wiring at a speed of 115.2K bit/sec. Maximum wire length is 11 miles.

One end of a Starbus Busdriver plugs into the serial port of a device on the network, the other into twisted-pair telephone wiring.

The Starbus Busdrive is priced at $350.

ACI, 1800 W. Park Drive, Westboro, Mass. 01581. 617-898-2500.

Local-area network software

An interactive software program said to allow users of **Network Systems Corp.'s** Hyperchannel networks to connect to other computers on the network has been announced.

Called **User-Access**, the software provides batch and interactive communication functions among both similar and different computers and operating systems. It interfaces with the vendor's Netex session-level software, which serves as a translator among operating systems.

Functions of User-Access include interactive file transfer, remote command execution and remote job submission.

User-Access is available for IBM's MVS and VM, Digital Equipment Corp.'s VMS, Unix and Apollo Computer, Inc.'s Aegis. It is priced from $8,000.

Network Systems, 7600 Boone Ave. N., Minneapolis, Minn. 55428. 612-424-4888.

Customer-premise equipment

A digital voice terminal designed for use with AT&T's System 75 and System 85 digital private branch exchanges (PBX) has been announced by **AT&T**.

Called the **AT&T 7401**, the terminal is a single-line digital voice terminal with five standard features that allow users to transfer calls or put them on hold; set up a conference call with up to three people or drop a conferee; and choose a distinctive ring for an office phone. Seven additional features can be programmed by the user.

The AT&T 7401 is priced at $125.

AT&T, 100 Southgate Pkwy., Morristown, N.J. 07920. 201-221-4355.

Links

A gateway between IEEE 802.3 local-area networks operating under Transmission Control Protocol/Internet Protocol and host computers and packet-data networks using the ANSI X.25 protocol has been announced by **Develcon, Inc.**

The gateway combines features of individual 802.3 and X.25 gateway cards. The 802.3 gateway includes support for up to 64 virtual circuits and throughput of up to 150 packet/sec. The X.25 gateway supports 96 virtual circuits with dual link speeds up to 100K bit/sec. It can process up to 150 packet/sec.

Packaged in a Model 5003R satellite node, the product costs from $13,500.

Develcon, Suite E, 6701 Sierra Court, Dublin, Calif. 94568. 415-829-6200.

Protocol converters

Smartnet 5250/T Plus, a protocol converter said to connect up to seven asynchronous terminals, personal computers, printers and graphics devices to the twinaxial port of IBM System/34, 36 and 38 computers, has been announced by **PC, Inc.**

Transparent to the host and user, Smartnet 5250/T Plus supports 45 menu-selectable asynchronous terminal types, including IBM's 3161, 3162, 3163 and 3164 and Digital Equipment Corp.'s VT100, VT102 and VT220. Up to seven tables supporting other ASCII display-device types can be configured.

Smartnet 5250/T costs $2,595.

PCI, 26630 Agoura Road, Calabasas, Calif. 91302. 818-880-5704.

File servers

A family of Intel Corp. 80386-based 20-MHz network file servers has been announced by **The Network Connection**.

The **Triumph 386** is said to be a fully integrated file server capable of operating under Novell, Inc. and Unix-based configurations. According to the vendor, it features data access times of less than 1 msec.

The Triumph 386 includes a 360K-byte floppy disk drive, a 4M-byte system memory, 64K bytes of static random-access memory, a monochrome monitor and an external uninterruptible power supply.

Bundled with Novell Advanced Netware 286 SFT Level II, the Triumph 386 is available in either 133M- or 266M-byte configurations, which cost $17,995 and $21,995, respectively.

The Network Connection, 1352 Union Hill Road, Alpharetta, Ga. 30201. 404-751-0889.

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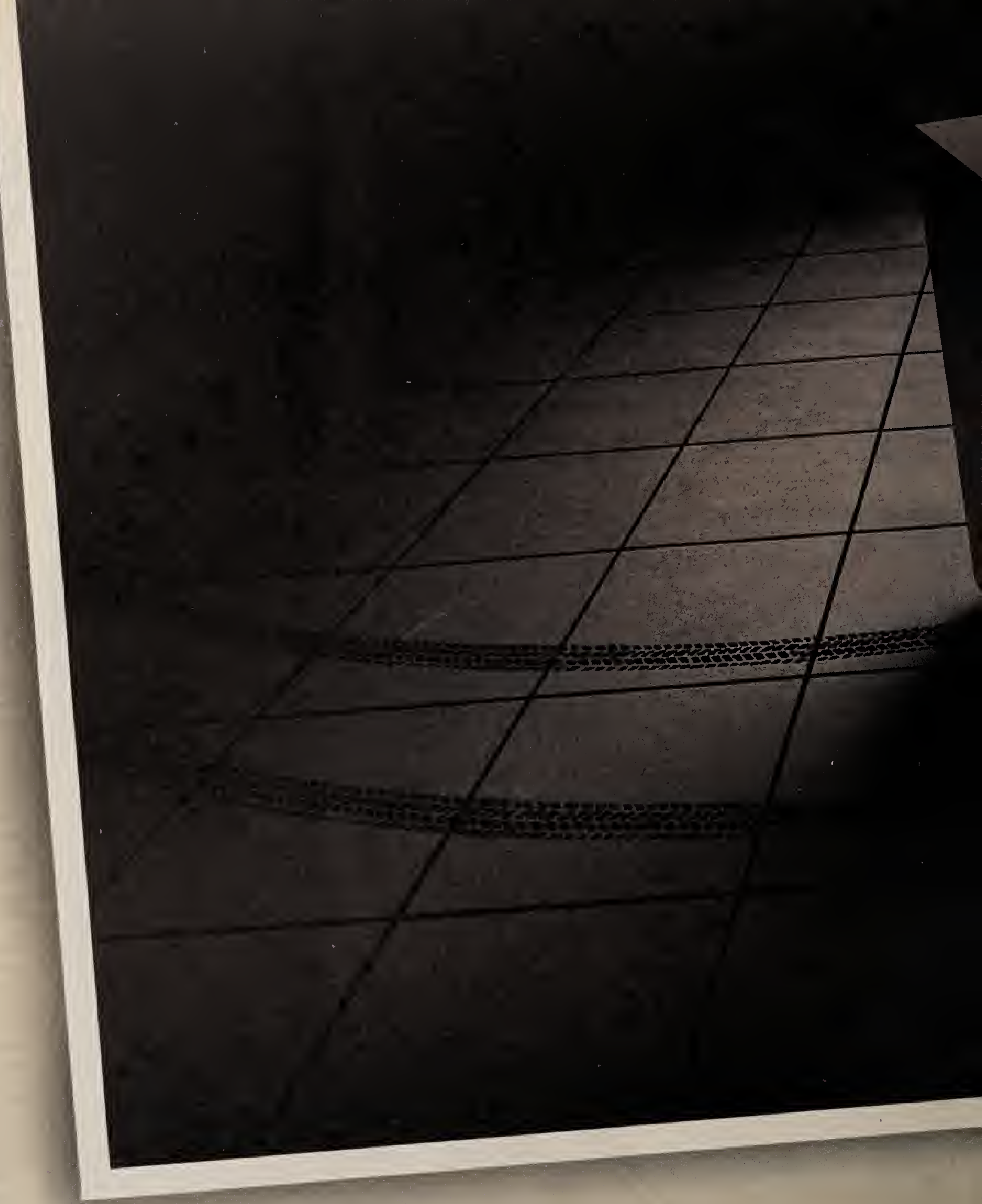

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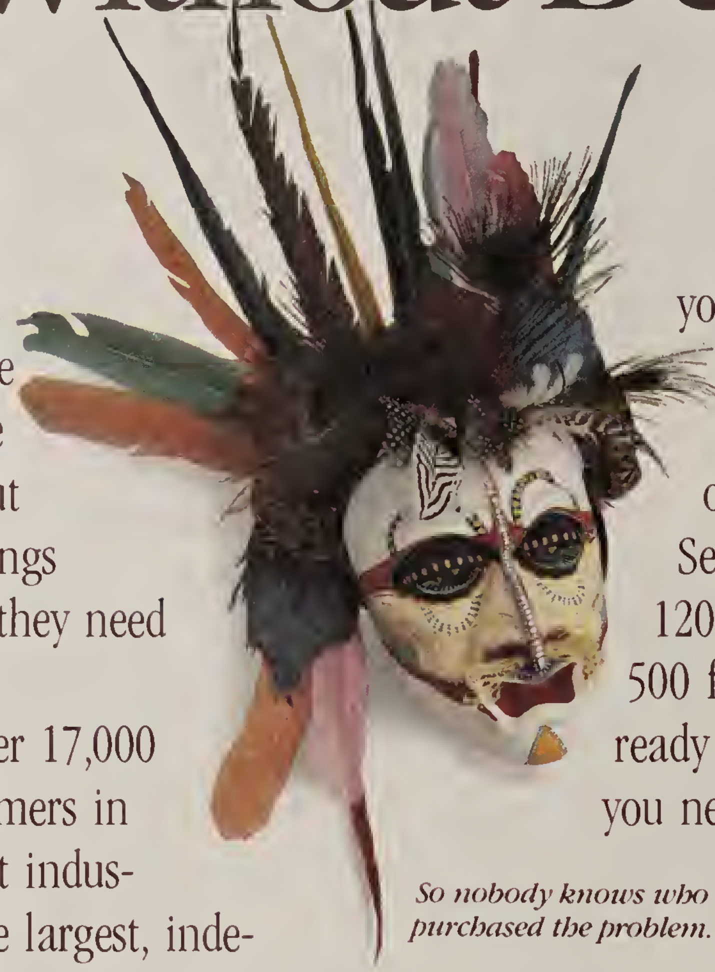

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SYSTEMS & PERIPHERALS

HARD TALK

James Connolly

The time is now

The time may have come for makers of Unix-based systems to differentiate themselves as individuals.

At any time during the past five years, one could easily have named a dozen vendors that claimed the best price/performance numbers for microprocessor-based hot boxes running Unix. A year later, one could have done it again, this time with two or three changes, as some vendors slithered out of the limelight and others joined the competition.

Now, it appears Unix vendors recognize they must do more than pop a Motorola 68020 chip into a box and pitch systems integrators on the merits of Unix while turning pages of flip charts detailing how their individual company gets *X* amount more bang for the buck.

Several recent product announcements gave hints as to how some of the Unix vendors have changed their tactics. In almost-simultaneous announcements, Ridge Computers and Celerity Computing introduced high-end processors and used

Continued on page 66

IBM CJ2 to launch DASD war?

Disk drive's speed, packaging, migration path target mid-range

BY STANLEY GIBSON
CW STAFF

IBM's announcement of its CJ2 disk drive has raised some eyebrows among users and analysts, as it puts another arrow in IBM's quiver for targeting competition in the minicomputer and small mainframe market.

The CJ2 offers about twice the storage of any Digital Equipment Corp. disk drive, with much faster seek times. At the product rollout last month, IBM described the CJ2 as serving the intermediate market, saying it is intended for the IBM 9370 and 4381 lines. The drive, which comes with the company's integrated 3990 controller, will reportedly be available in the third quarter of 1988.

"If storage were a significant component of a bid with DEC, it could be a great advantage for IBM, because DEC has nothing to compete with it," said James Porter, president of Disk/Trend, Inc. in Los Altos, Calif. He said the CJ2 raises the point that a user might buy an IBM CPU simply because of compatibility with IBM direct-access storage devices (DASD) whose capacity, speed and reliability exceed those of DEC's DASDs.

During a storage seminar at the recent Decworld '87 show in Boston, Grant Saviers, DEC's vice-president of storage subsystems, sought to minimize the significance of IBM's gains.

"We were a little flattered by the IBM announcement, in that [the CJ2] includes a separate data path to each actuator. DEC has been doing that right along," he said. That feature allows a user to cable and uncable disks without taking the system down.

Stacked against DEC?

Saviers conceded that IBM can put more gigabytes of storage on a system than DEC can, but he asserted that a system must be judged in its entirety, including software, operating system, channel and the way all the parts interact. He said DEC can, in some of these areas, compensate for a deficit in seek times.

DEC's high-end RA 82, which is its product most likely to compete with the CJ2, records an average seek time of 24 msec, according to DEC. The CJ2, meanwhile, has been clocked at an average seek time of 12 msec, according to IBM.

"DEC can probably put together a configuration in which they make the most of their advantages against IBM," Porter said, adding that IBM could, likewise, contrive configurations that put the firm in a good light.

Another IBM selling point is the ability of a user to protect his DASD investment by moving a CJ2 from a 9370 to a 4381 in an

Continued on page 67

NEW TECHNOLOGIES

Waiting for superconductors

BY MICKEY WILLIAMSON
SPECIAL TO CW

When they emerge from the laboratories, high-temperature superconductors are likely to appear in computers as films and wires only a few millionths of a meter thick and as devices that enable computers to perform switching functions 100 times faster than conventional integrated circuits allow.

For instance, at GTE Laboratories, Inc. in Waltham, Mass., Walter Carleton talks about superconductor chip-to-chip interconnects that will run faster, cooler, at lower power and with less signal dispersion, thus reducing a serious problem of conventional wiring.

Superconductive wire would provide fast-

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CHRIS DEMAREST

Inside

- Ink-jet printer claims near-photo quality. Page 66.
- Honeywell Bull issues duplex printer. Page 67.
- Clearpoint adds memory card for Microvax 2000. Page 71.

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The time is now

CONTINUED FROM PAGE 63

the same term — balanced performance — to describe their overall system throughput, rather than the raw CPU power that was cited in previous announcements.

Such vendors also have more frequently tossed around the names of data base management system vendors in apparent recognition that supporting third parties translates to added value.

Meanwhile, one of the first Unix hot box makers to emphasize added value — Computer Consoles — enhanced its Officepower office automation software with support for Access Technology's 20/20 spreadsheet and Hewlett-Packard and Xerox printers.

Plexus repositions

Earlier this year, Plexus Computers built onto its line of superminicomputers, adding combinations of hardware and software — including optical disk drives, relational data bases and scanners — that were designed to position Plexus as an integrated information management vendor.

UNIX VENDORS recognize they must do more than pop a Motorola 68020 chip into a box and pitch systems integrators on the merits of Unix.

Perhaps the biggest gamble by a Unix vendor looking to add value and establish an individual identity came last month when Pyramid Technology entered the on-line transaction processing (OLTP) market by porting Sybase's DBMS to Pyramid systems.

Analyst George Weiss of the Gartner Group, a Stamford, Conn., market research firm, observes that Pyramid "seemed to be in a rut" and, thus, had to make such a move. It is a move that could take a year or two to bring benefits, because Pyramid must build up third-party channels, and it pits Pyramid against some of the giants of the computer industry, including IBM and Tandem, Weiss says.

Future so bright?

According to Weiss, the future for Unix looks good with the possibility that 25% to 33% of the commercial market will be Unix-based by 1991.

He adds that many of the technical breakthroughs and commitments to standards come from Unix vendors. He says one key to that growth will be for vendors to bury the user-unfriendly portions of Unix under interfaces such as the SQL used by Sybase.

But he also notes that companies like Pyramid still have to battle to overtake established vendors such as Unisys and NCR even within the Unix market, and, as they become more successful in their new niches — OLTP for Pyramid — they will run into the IBMs and Tandems of the world at every turn.

Connolly is *Computerworld's* senior editor, systems & peripherals.

Ink-jet printer claims quality color

READING, Mass. — Iris Graphics, Inc. claimed a breakthrough in color printing last week with the introduction of an ink-jet printer series designed to produce high-quality paper output from high-resolution graphics workstations.

The company said the Iris Series 3000's custom-designed continuous ink jet's work combines with digital electronics to produce images with a precision rivaling photographs and lithography. The first product in the series is the Iris 3024 printer.

The printers are targeted primarily at the printing and publishing industries for prepress preparation of pages containing color images.

However, Iris officials also said other uses may be found in computer-aided design, engineering, manufacturing and scientific applications.

The printers were designed to work with a variety of graphics workstations, personal computers or minicomputers using high-resolution color imaging software.

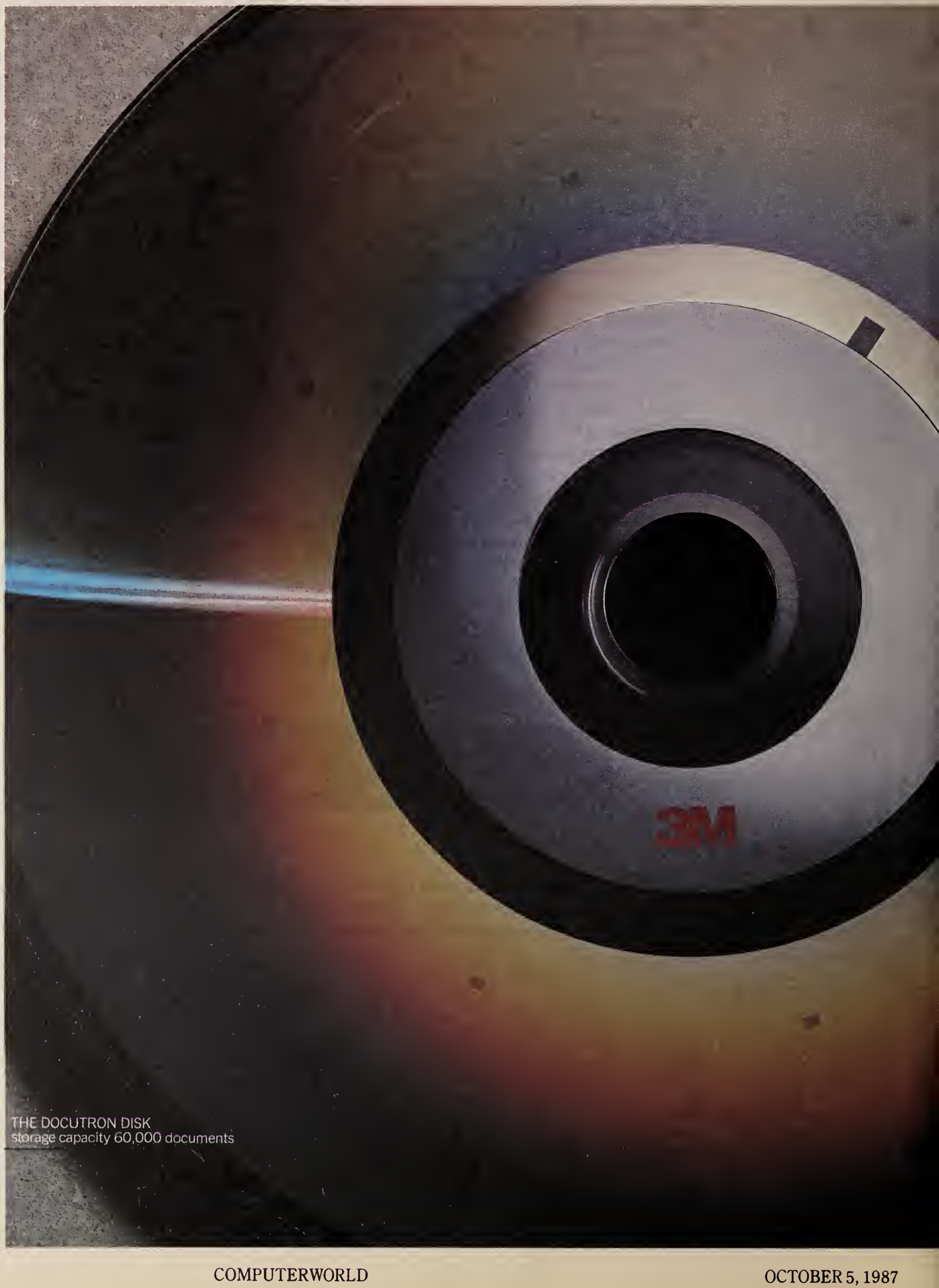
The Iris Series 3000 is based on continuous ink-jet technology developed by Swedish scientist C. Hellmuth Hertz. Company officials said Iris made several enhancements to that technology, which uses 10- and 12-micron nozzles.

In comparing the printer with the older Iris Series 2000, Iris said the Iris Series 3000 can form and place 31 different-size dots, compared with only one size for the earlier model.

The company also claimed to be able to produce dots about 15 microns in diameter, which is one-tenth to one-fifth the size of those made by competing drop-on-demand printers.

The company claimed that 256 of 448 possible shades of grey can be produced using a four- by four-pixel lookup table, which smoothes the color steps.

The basic printing unit with a 24- by 24-in. maximum image costs $75,000. The printers will be in beta testing for the next few months with delivery of production units set for the first quarter of 1988.


THE DOCUTRON DISK
storage capacity 60,000 documents

IBM CJ2

CONTINUED FROM PAGE 63

upward migration.

"IBM is continually making a path to 3090s. It's another push to the summit. IBM wants to get as many people to the 3090 as possible," said David Vellante, an analyst with International Data Corp.

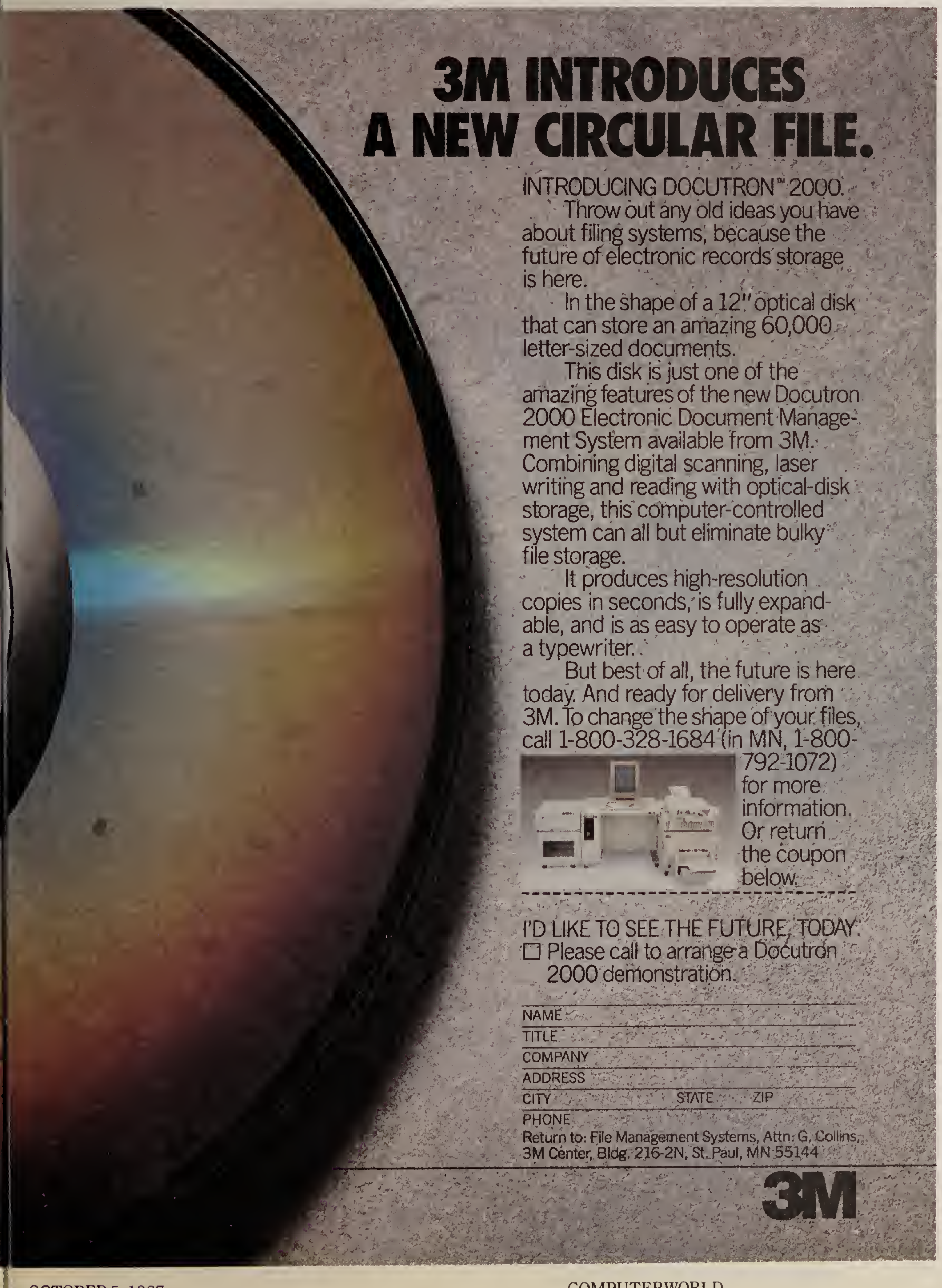
However, Vellante pointed out, there is a conflict between the fixed-block architecture of the IBM 9335 and 3370 disk drives and the count-key-data architecture of the CJ2 and other 3380 drives. Some software adaptations would have to be made in changing architectures, he said. Users of 9370s running MVS, which IBM says will be available for Models 60 and 90 during the fourth quarter, will have to use a 3375- or 3380-type disk in any case, because the 9335 is not supported under MVS. "The CJ2 is really a kludgy and rocky road to the summit," Vellante commented.

One user concurred and said the drive would not fit his plans. The user, who is the MIS director for a food retailer, said his firm is planning a nationwide distributed system using 9370s with 9335 disk drives in different locations. "We would have to remap our files. I don't want to switch fixed-block to count-key-data. It's not the strategic direction we want to head in," he said.

However, the drive could help users move software written for large IBM 370 architecture systems down to the 9370, according to another user. Chart, Inc., a not-for-profit health care services information provider in Schenectady, N.Y., is adapting a 4381-based hospital management system to the 9370, said Bill West, director of information services for Chart.

Once the CJ2 is available, it will fill the needs of customers with large DASD requirements, West said. However, Chart is rewriting its programs from a count-key-data architecture to fixed-block to accommodate early customers and those whose needs are filled by 9335 devices.

There will be two kinds of happy CJ2 users: those using it as the head of a string for 3380 drives, in place of a regular controller; and 9370 users who require more storage than that of the 9335, Disk/Trend's Porter said.



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Honeywell Bull adds printer

MINNEAPOLIS — Honeywell Bull, Inc. recently introduced a nonimpact duplex printing system featuring a Honeywell Bull DPS 6/70 controller and multiple Motorola, Inc. 68020-based microprocessors.

The printer, called the 4180D Printing System, is said to be capable of printing duplex originals at 180 impressions per minute. It features an Ethernet interface, electronic forms and fonts design and optional image processing.

The 4180D runs on a Honeywell Bull DPS 6/70 miniprocessor and includes 295M bytes of disk storage. Data input options consist of on-line connections to selected hosts, including those made by Honeywell Bull or IBM; remote interfaces via communications options; and off-line, 6,250 by 1,600 bit/in. tape input.

According to Doug Aber, director of page processing operations, the 4180D provides new levels of component and system diagnostics. Included are intelligent diagnostics at both the component and system levels. He said the user can see faster problem analysis, greater efficiency and lower operating costs.

Available now, a basic 4180D Printing System, including a controller, a printer, an on-line host attachment and electronic forms and font design, is priced at $325,000.

NBI drive ups 570's storage

BY SUZANNE WEIXEL
CW STAFF

BOULDER, Colo. — NBI, Inc. recently announced increased storage capacity and decreased pricing for its 570 32-bit computer system.

With the introduction of a 494M-byte disk drive, NBI has increased storage for the 570 to nearly 2G bytes, according to John Ball, NBI's group product manager for computer systems.

The 494M-byte 8-in. drive is manufactured by Northern Telecom, Inc. It features an average access time of 18 msec. and a transfer rate of 2M byte/sec., which is 30% faster than the rate of the original 269M-byte drive, the vendor said.

The 570, part of NBI's 500 family of Unix-based systems, was introduced in September 1986 with the 269M-byte drive. "The entire 500 family accounts for nearly 1,000 systems in the marketplace," Ball said. "It is primarily used for vertical departmental applications built upon data bases, such as in the legal field. The 570 supports up to 64 users, but for optimum processing, we recommend 32 concurrent users to our customers."

NBI announced price reductions of up to 30% for the 570. Ball said the price cuts resulted from enhanced manufacturing capabilities. The price of a basic configuration of the NBI 570 equipped with a 269M-byte drive, a ¼-in. tape backup, 16 ports and the Unix operating system has been reduced by 18% to $41,000. With a 494M-byte drive, it costs $47,000.

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RESERVATION DATE:  12/10/87

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    DATE :

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    TIME :

OPERATOR NO:  3109566
ACCESS CODE:
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Nonvolatile memory for saving setup
National language layouts available

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Compatibility Modes
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IBM 3270 Information Display System, coax connection

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24 programmable function keys for application use
Tactile feedback

Ergonomics
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Green or amber display
Tilt and swivel
Front panel controls
Detached adjustable keyboard

Additional Features
Security lock and keys
Automatic screen saver
Easy setup menu

Other
1 year warranty
Nonvolatile memory for saving setup information
National language layouts available

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HP 700/41
Entry Level ASCII Terminal

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TeleVideo 905, 910+, 925E
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ADDS Viewpoint A2
Qume QVT-101

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16 function keys (32 shiftable)
58 programmable keys
Tactile feedback

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Additional Features
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Easy setup menus

Other
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Variable smooth scrolling
Copy and transparent print modes
Nonvolatile memory saves setup, programmed key info
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Waiting

FROM PAGE 63

er chip communications by making chips more dense and allowing them to be placed closer together, with more circuits on each chip. Using normal materials, the thinner the wire, the more resistance it has, and more resistance means more heat. Superconducting wires would not get hot.

"The ability to eliminate one of the sources of heat would be very useful to users of high-performance machines," says Gerald Present, an IBM physicist and spokesman at the company's Thomas J. Watson Research Center in Yorktown Heights, N.Y. The result could be smaller computers with microprocessors running at speeds of as much as 30 million instructions per second.

But before superconductors have any real effect on the way you live and work, the right materials must be found to create them and stable operating conditions achieved. Also, techniques must be discovered for forming them into appropriate shapes.

Paul Fleury

Finally, they have to get out of the labs, and mass production methods have to be developed.

To sum up the outlook for computer applications of superconductors: Pay attention, but don't expect immediate availability of products, because attaining critical temperatures is not the only stepping stone to use of the technology.

Major obstacles

Even with material at the right temperature, there are two other ways to quelch superconductivity. One is by putting it in too high a magnetic field. The other is by running too high a current through it. While popular attention is focused on critical temperatures, much scientific attention is concerned with attaining a critical magnetic field and a critical current density.

So far, AT&T's Bell Laboratories holds the record for ceramic-form — as opposed to thin-film — current densities, but it is only a few thousand ampere/sq cm. For electronic applications, "that's practically worthless," says Paul Fleury, director of Bell Labs' physical research laboratory. Current densities of 100,000 ampere/sq cm are needed for chip-to-chip interconnects and one million ampere/sq cm for intrachip wiring.

Lately, IBM has succeeded in making a thin film that will carry 100,000 ampere/sq cm, and AT&T and Nippon Telephone and Telegraph Public Corp. independently achieved current densities of more than one million ampere/sq cm at liquid nitrogen temperatures.

"That's getting pretty close to where somebody in the applications business might listen to you for a few minutes," Fleury remarks. "But those are all research laboratory results under highly specialized conditions."

The applications that capture the imagination must wait until the problem of critical magnetic field — the strength with which a superconductor is able to expel externally imposed magnetic forces — has been solved. When it is, these superconductors will be able to generate magnetic fields capable of powering economically feasible magnetic levitation trains and doughnut-shaped magnets able to store enough power to run the city of Boston for a couple of days.

Fleury says, "In order to generate a magnetic field anywhere beginning to approach the critical field of these materials, you would have to have current densities many orders of magnitude higher than we've now been able to make them carry."

Manufacturing dilemma

Then there's the problem of actually making these things. High-temperature superconductors are ceramic materials. Typically, their metal constituents are ground to a fine powder, mixed with a binder and fired the way clay is fired to make pottery, burning away the binder and fusing the remaining powder into a rigid shape. And that's the problem: So far, ceramic wires, no matter how fine, are brittle and unable to be shaped into the forms needed to make magnetic coils or transmission lines.

That issue is being tackled, however. George McKinney, president of Boston venture capital firm American Research and Development Corp., recently signed a deal to fund American Superconducting Corp., an MIT spin-off that will use currently available metal-forming technology and conventional metal alloys to form its products and then fire them so they attain a state chemically identical to ceramic oxide. By the time the alloys become rigid, they will already be in the proper shape.

What can superconductors do? Bulk conductors — wires and tapes — have possibilities for large-scale applications like power transmission and storage and, in transportation, as a magnetically levitated vehicle.

Walter Carleton

For the price of a good steak dinner, you can buy a superconducting ceramic disk from a scientific supply house, cool it to 83 degrees Kelvin with readily available liquid nitrogen and demonstrate one of the phenomenon's qualities, the Meissner effect of magnetic levitation, which repels a magnetic field applied to the surface of the superconducting material. But demonstrating it is one thing, and getting useful work out of it is quite another.

Low-temperature helium-cooled superconductors are already at work in magnetic resonance imaging for medical diagnostics and in a superconducting quantum interference device (Squid) that is extremely sensitive to magnetic fields and is used in military aircraft to detect the presence of submarines.

Hypres, Inc. in Elmsford, N.Y., founded in 1983 by a former IBM scientist, makes an oscilloscope using a low-temperature superconducting chip. With its six-figure price tag, "It's definitely not something to fix the television set with," remarks Kurt Miska, editor of Norwalk, Conn.-based Business Communications Co.'s "Electronic Materials Technology News."

Applications in space

The Office of Innovative Science and Technology, a funding source for the Strategic Defense Initiative, has allocated $500,000 this year and $2 million next year for superconductor research. Low-temperature superconductors are adequate for space, where the ambient temperature is colder than the boiling point of liquid nitrogen.

Recently, scientists at the National Bureau of Standards in Boulder, Colo., have made a high-temperature Squid that can operate at 81 K (-192 Celsius or -313 Fahrenheit). But it, like the rest of the high-temperature devices, is far from becoming a product.

Penetration of the marketplace is another matter. George McKinney says the first significant impacts will be in the fields of instrumentation and microwave communications, which will happen five years from now. "Demonstration systems in three years, 10% penetration in five," he predicts.

Miska says he thinks the first impact will be in microelectronics. John Chi of the Watson Research Center says IBM has "no timetable for computer applications — it won't be next year." However, Miska says he wouldn't be surprised if "AT&T or IBM or some Japanese company" starts producing prototypes of superconductive computer devices in 1988, reaching production quantities by 1990.

As for large-scale applications that make a difference in the way we live, predictions range from an optimistic 10 years to 20 years and, to one observer's vehement, "Hogwash. Not in our lifetime." Take your pick.

Williamson is a technical journalist and consultant based in Warwick, Mass.

Search for a super alloy

The physical principles underlying superconductivity are the following: The atoms in matter are constantly in motion; Electric current flowing through an object is jostled by its moving atoms and loses some energy as a result — this is electrical resistance; As an object is cooled, the activity of its atoms decreases; Atomic motion stops at absolute zero temperature — 0 degrees on the Kelvin scale — the equivalent of -273 Celsius or -460 Fahrenheit.

Superconductivity was discovered in 1911 by Dutch physicist Kamerlingh Onnes, who found that mercury lost all resistance to the flow of electricity when it was cooled to nearly 0 K. The only known substance that can achieve sufficiently low temperatures is liquid helium, which boils — that is, becomes a gas — at 5 K. Three years earlier, Onnes had discovered how to liquify helium.

Different metals make the transition to superconductivity at different temperatures, but all of them do it at low numbers on the Kelvin scale. Tin does it at 3.2 K, lead at 7.2 K. The search was on to find the metal alloy with the highest possible transition temperature.

A strong beginning

By 1973, scientists had found a metal alloy with a transition temperature of 23 K. That limit held firm for 13 years — and not because of lack of effort. Many people worked on it, but they could not raise the transition temperature as much as one-tenth of a degree, says John Chi of IBM's Thomas J. Watson Research Center in Yorktown Heights, N.Y.

Then, early in 1986, K. Alex Muller and J. Georg Bednorz, scientists at IBM's Zurich research laboratory, announced a ceramic material made of lanthanum, barium and copper oxide that became superconductive at 30 K.

The discovery, Chi says, "was like a dream come true." And Muller's recipe was easy enough to reproduce in a moderately equipped laboratory.

So the race toward ever-higher transition temperatures was on. By February 1987, a team at the University of Houston, led by Paul Chu, had substituted yttrium for lanthanum and found a compound that became superconductive at 98 K. That's higher than the boiling point of nitrogen, and nitrogen is both cheaper and easier to handle than helium.

Quest for grail heats up

Since then, hardly a week has passed without news of an even higher transition temperature. The grail in this quest is a substance that exhibits zero electrical resistance at room temperature. Like grails in general, it is elusive. And even if it is found, producing it in forms suitable and quantities sufficient for commercial use are two other, equally thorny, problems.

What the news reports usually leave out is the fact that most of these higher temperatures are transient events, not yet produced in a predictable way. Normally, laboratory scientists do not talk about the results of their research until they have submitted their results to learned journals for review by their peers before publication. Why, then, this uncharacteristic exuberance, this rush to report breakthroughs to the news media before they have been reproduced and verified by objective outsiders?

First, because of the excitement in the scientific community that Muller and Chu's breakthroughs have engendered. Second, because the stakes are so high and the rewards apt to be so great for those who succeed.

Like Onnes earlier in this century, somebody, or a team of somebodies, is going to get a Nobel Prize out of this. The timing of an announcement may be critical.

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NEW PRODUCTS

Processors

A 16M-byte memory card for Digital Equipment Corp.'s Microvax 2000 and Vaxstation 2000 has been announced by **Clearpoint, Inc.**

The **MV2000** replaces the 2M- or 4M-byte daughtercard that comes with the Microvax system. According to the vendor, memory access and cycle times are unchanged by the increase in capacity. The board utilizes surface-mount megabit dynamic random-access memory technology.

The MV2000 is priced at $7,450.

Clearpoint, 99 South St., Hopkinton, Mass. 01748. 617-435-5395.

Graphics systems

The **Baja Colorgraphics Display System**, a ruggedized version of the vendor's Le Mans, has been announced by **Chromatics, Inc.**

The Baja features a microcoded implementation of industry-standard Graphical Kernel System (GKS) software. It can draw one million fully transformed two-dimensional vectors per sec. and 250,000 fully transformed three-dimensional vectors per sec. It can generate 25,000 smooth-shaded polygons per sec., utilizing the Gouraud algorithm with hidden surface removal in 3-D applications.

The graphics engine can contain up to 32M bytes of display-list memory and up to 24 double-buffered bit-mapped memory planes. Baja also provides a 1,280- by 1,024-pixel noninterlaced display monitor.

Pricing starts at $34,000.

Chromatics, 2558 Mountain Industrial Blvd., Tucker, Ga. 30084. 404-493-7000.

Data storage

A dual-drive subsystem that is said to provide redundant data storage for Q-bus systems, IBM Personal Computer ATs and Apple Computer, Inc. Macintosh computers has been announced by the Ford/Higgins Division of **Century Data, Inc.**

The **Shadow** subsystem is composed of two 86M- or 170M-byte 5¼-in. fixed Winchester disk drives, two controllers and two power supplies and switches. Data is written to both disks simultaneously but is read from only one disk at a time.

Single-quantity pricing is $4,395 for the 86M-byte model and $5,995 for the 170M-byte model.

Century Data, Ford/Higgins Division, 1301 Sunset St., Longmont, Colo. 80501. 408-298-5756

Terminals

Two color data, graphics and video projection systems have been announced by **Electrohome Ltd.**

The **ECP Graphics** projection system is a single-lens design that runs from 15 to 80 KHz and projects data and graphics on flat, curved or rear screens from 5 to 14 ft. The **ECP 3000** is a three-lens projector that runs from 15 to 50 KHz and projects on screens from 5 to 25 ft.

ECP Graphics is priced at $21,995. ECP3000 costs $14,995.

Electrohome, 809 Wellington St., N. Kitchener, Ont., Canada N2G 4J6. 519-744-7111.

Printers/Plotters

Two 250 char./sec. dot matrix printers said to provide full compatibility with Digital Equipment Corp.'s LA50 printer have been introduced by **C. Itoh Electronics, Inc.**

The 10-in. carriage **9500D** and the 15-in. carriage **9515D** offer a choice of print speeds with a 60 char./sec. near-letter-quality memo mode and a 28 char./sec. letter-quality mode.

They use a 9-wire printhead and offer a resolution of 240 by 144 dot/in., according to the vendor.

Paper-handling capabilities include single-sheet and tractor-feed operation and optional single- and dual-bin sheet feeders. Other standard features include an expandable 2K-byte buffer.

The 9500D costs $749 in single quantities; the 9515D costs $949.

C. Itoh Electronics, 19300 S. Hamilton Ave., Torrance, Calif. 90248. 213-327-9100.

Power supplies

Data General Corp. has introduced a line of **uninterruptible power supplies** for use with its Eclipse and Eclipse MV family systems.

The power supply is a continuous-duty, on-line peripheral designed to provide from six min. to several hours of conditioned backup power to the DG computer system in the event of an AC power failure or fluctuation in voltage, the vendor said.

Six models are offered. Single-phase units are available in 3, 6 and 8 kVA power ratings and operate on 120/208V, 60Hz input power. Three-phase units are available in 10, 15 and 20 kVA power ratings and operate on 208V, 60Hz input power.

The UPS models are priced from $7,400 to $34,500.

DG, 4400 Computer Drive, Westboro, Mass. 01580. 617-366-8911.

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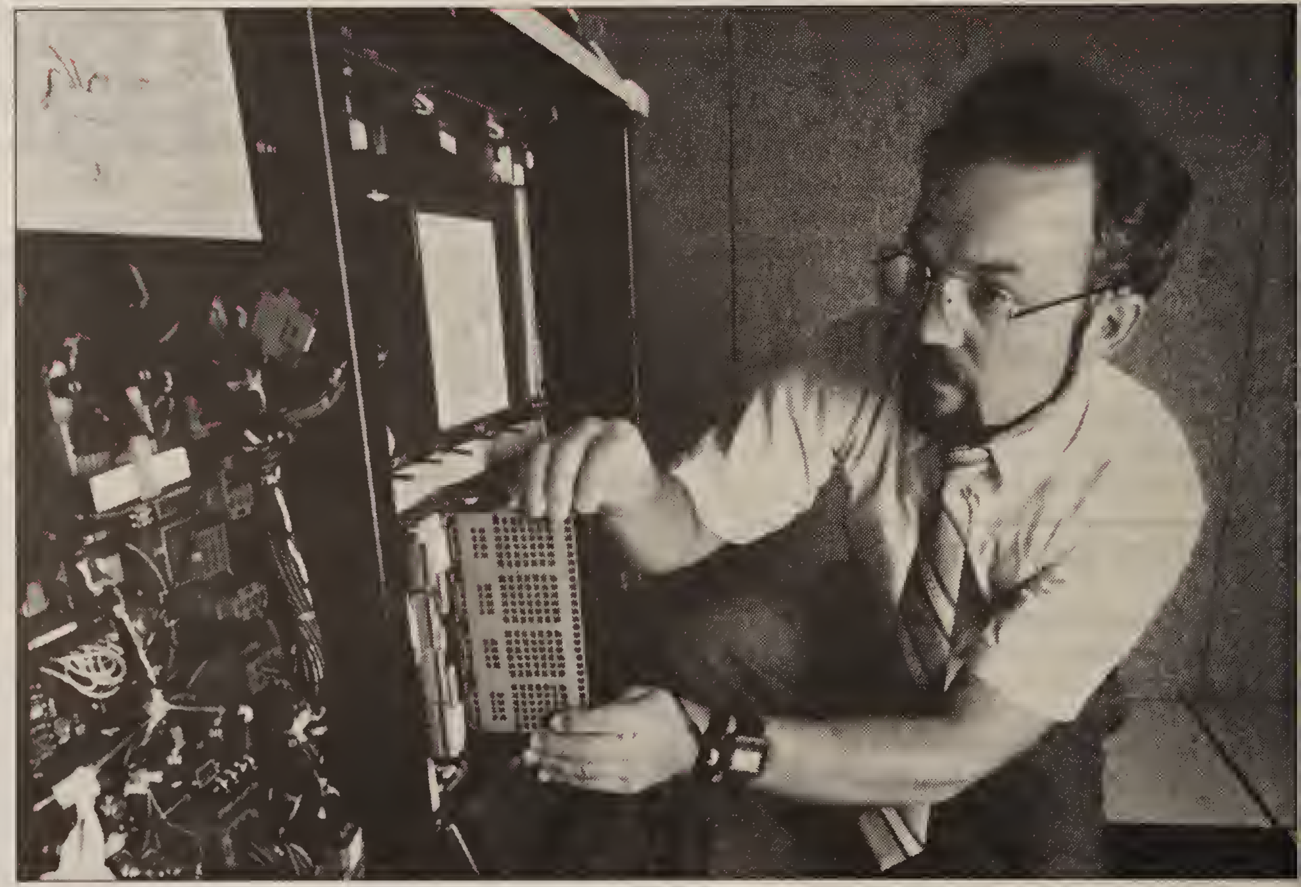

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CCWJ05

U.S. shares know-how with China — selectively

Joint ventures: 'Sleeping in the same bed, dreaming different dreams'

BY JOHN MAIER

Second in a two-part series

In the computer market in the People's Republic of China, there is both a technology push and a market pull, yet resisting forces continue to interfere with the free flow of technology transfer.

The pull is China seeking to modernize; the push comes from Western corporations seeking markets. Resistance arises from the vested interests of the intermediary agents — licensing officials in the U.S. and conservative bureaucrats in China. This resistance has become a significant factor in the process of transferring computer technology from the U.S. to China.

"Technology transfer" does not mean the transfer of products — it is the transfer of know-how. Thus, when a computer is sold to China, the U.S. is not transferring technology, although it is transferring a technological product.

The fear, expressed by some, of reverse engineering is the basis for much of the resistance to technology transfer. In my view, however, this is not a threat with today's technologies, which require hundreds of thousands of detailed steps of forward engineering.

The Soviet Union's experience in attempting to replicate IBM 360 hardware and software, for example, showed that such efforts are usually unsuccessful and also usually more costly than the original engineering.

Although at least a half-billion dollars' worth of computer hardware has been sold to China by Western nations in the last decade, conflicts still arise with licensing bureaucrats in Washington, D.C., who usually misuse national security as their justification.

For example, one small, entrepreneurial U.S. computer consulting firm that established an office in Shanghai showed exceptional sensitivity toward local efforts to absorb automation.

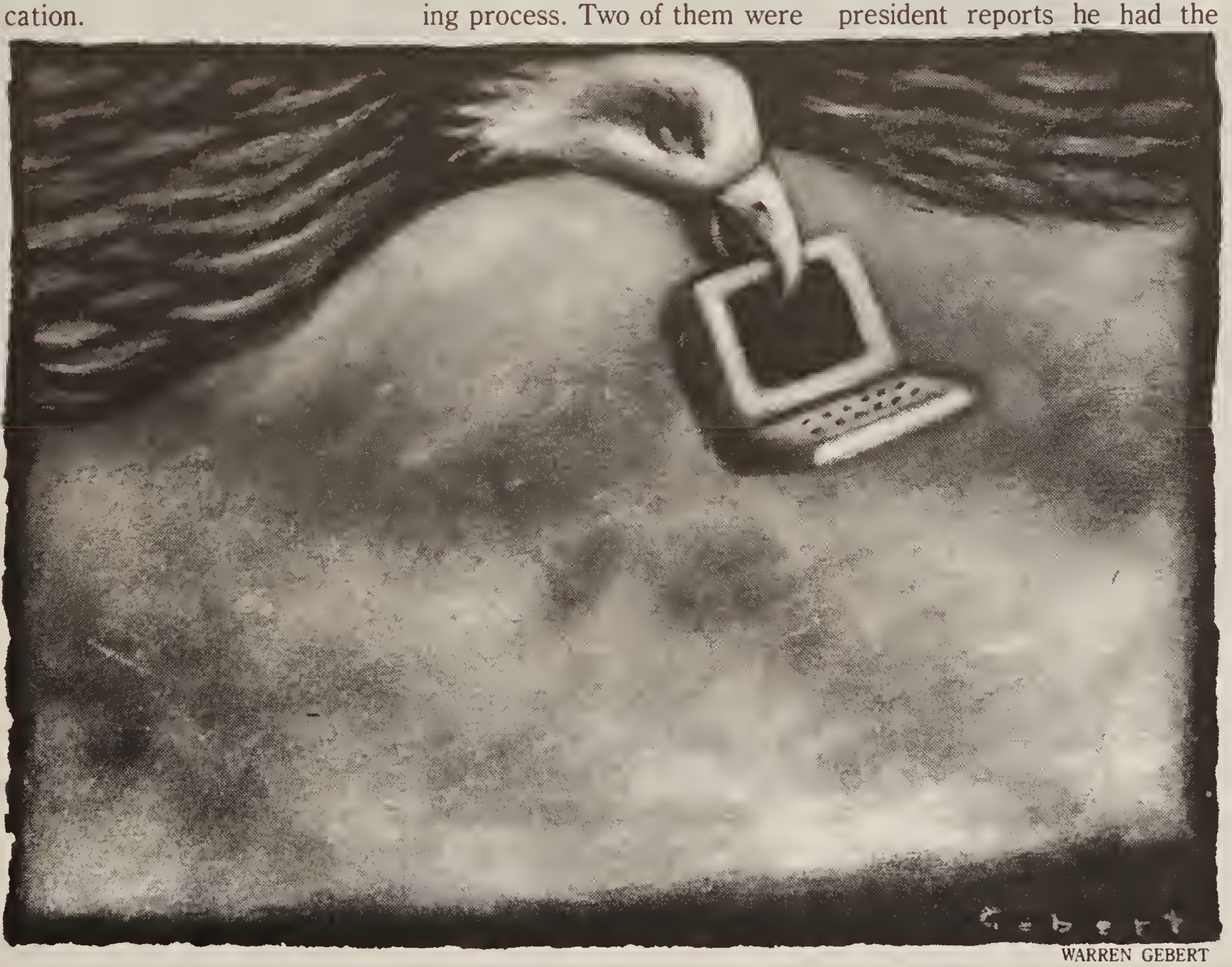
The corporation's president, however, was emphatic about his experiences with the licensing process on the U.S. side. He says that despite China's longtime stereotype, in this case "it is Washington, D.C., that is inscrutable."

The problem, he explains, was the "curious disorganization" that he encountered in Washington. At one point, he had consulted eight different presumed experts on the licensing process. Two of them were in government, and the others were lawyers, lobbyists, consultants and the like.

He received eight completely different stories on what he should do to get the scheme approved. And each of the eight told him reasons why the other seven experts were wrong.

Finally, he tracked down the officials at the Pentagon who were familiar with U.S. policy. From that point on, he says, "it was smooth sailing."

In the course of 10 minutes, one official explained what the computer consulting company could and could not do and which requests would be granted or flatly denied. The frustrated president reports he had the



WARREN GEBERT

Maier is a computer scientist in Fort Worth, Texas. He is currently organizing the extension of a wide-area network with China. He recently founded the Systemic Threshold Advanced Research (STAR) Institute, a nonprofit international venue for research at disciplinary boundaries and thresholds.

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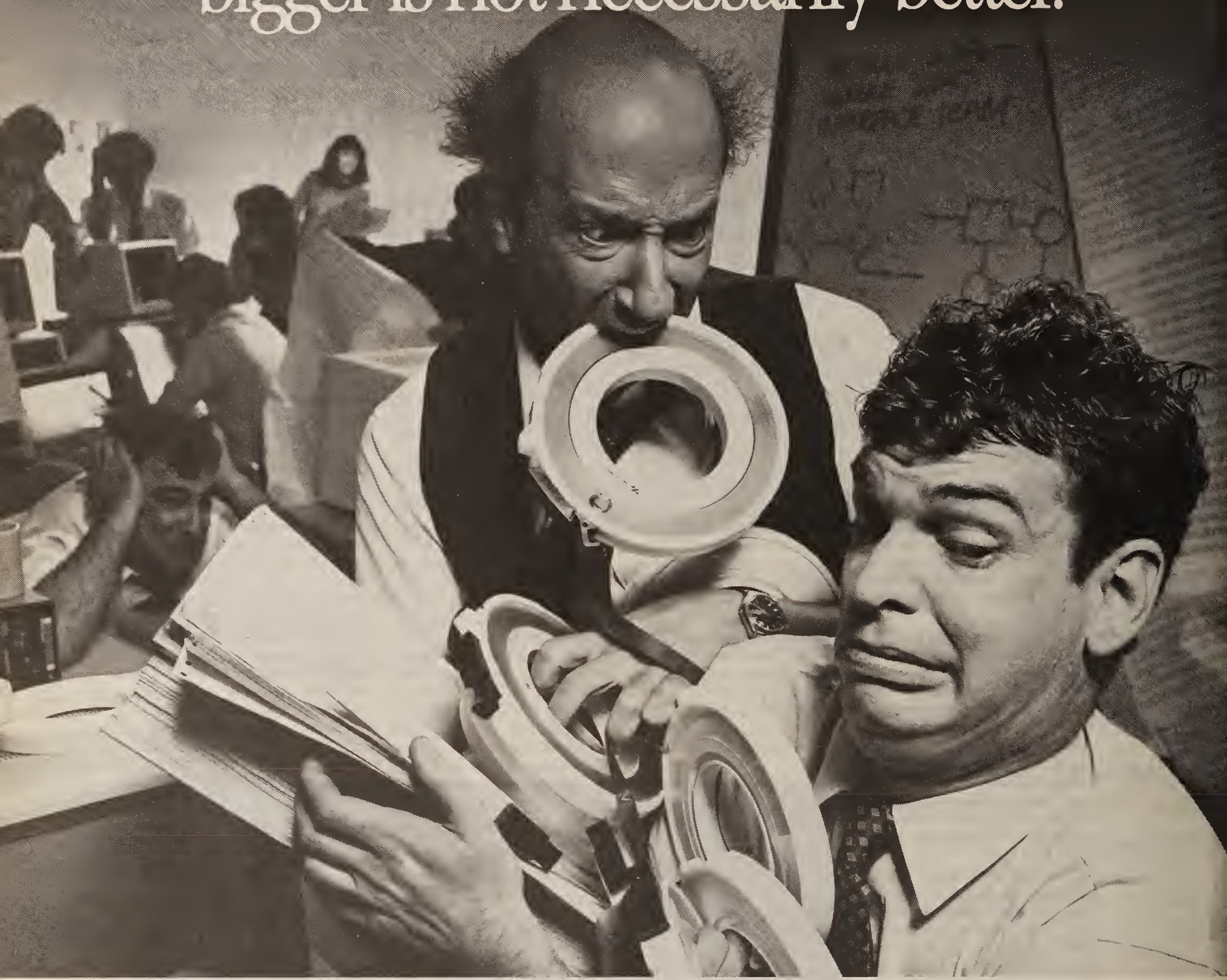

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license two months later.

Part of the problem is an inherently contradictory stance on the U.S.'s part. China is important to our national interests. Accordingly, we welcome more than 15,000 Chinese graduate students to our college campuses. Yet we still perceive China through ideological lenses by characterizing the country as "communist," which puts us in a bind.

One way out is to perceive China as a developing country, one that is not militarily expansionist, is an agent of stability in the Asian region and has the right to define its own domestic political identity.

The U.S. has laws on the books, dating from the 1950s, that prohibit certain activities with "communist" countries, but that thinking triggers knee-jerk anticommunist policy-making. In my view, it does a disservice to the best interests of the U.S. and demonstrates a naivete about the diversity of the countries of the world.

> ONE WAY out is to perceive China as a developing country, one that is not militarily expansionist, is an agent of stability in the Asian region and has the right to define its own domestic political identity.

To be blunt, the U.S. needs a coherent 21st-century China policy.

'A fair-sized industry'

In 1978, China's then-vice-premier for science and technology, Fang Yi, now state councillor, predicted at China's National Science Conference in Beijing: "Microcomputers will be popularized and giant ultra-high-speed computers put into operation. We will also establish a number of computer networks and data bases. It is essential to equip information institutions with modern facilities in the shortest possible time."

China's stated goal was to acquire a "comparatively advanced force in research in computer science" and to build a "fair-sized modern computer industry." I was working in Washington, D.C., at that time, within a year of when full normalization of relations between the U.S. and China would be announced and Premier Deng Xiaoping would stand on the White House lawn for the official ceremonies.

In Washington, those of us who were sensitive to Fang's words realized that a very important turning point was occurring. Clearly, China's modernization was going to have to be a mix of domestic capabilities and an infusion of more advanced technological capabilities from abroad, thus the "open door."

In 1972, Nixon had been the first U.S. president to visit the People's Republic of China, and, as a result, the Shanghai Communique was signed, and the U.S. embargo of technology trade to China was lifted. When Nixon's presidential party departed from China, it left behind as a gift to the Chinese people a complete Intelsat-class satellite ground station, brought in to support the communications needs of the president.

Symbolically and electronically, China was plugged back into the world. However, China's export control category was elevated only to the same level as that of the Soviet Union — "severely restricted." But policy changed rapidly after the Russian invasion of Afghanistan, and China's geostrategic role, combined with a now-pragmatic Chinese leadership, became part of the American global strategic equation for stability in Asia.

First, technology export levels to China were up to twice that for the Soviet Union, but this proved to be an awkward formula to manage. Finally in May 1983, the Reagan administration, under pressure from both the push and pull forces and with geostrategic motivations, moved China into a Department of Commerce export category, which contains most of our West European allies. In the eyes of the U.S. government, China had become a "friendly" country for export control purposes.

This clarification of the U.S.-China relationship needs to be well disseminated throughout all departments and agencies of the U.S. government. Only a year earlier, for example, a Department of State desk officer took it upon himself to do what he saw as his duty to protect American technology. He wrote to Stanford University and several other universities stating that certain Chinese students would have ". . . no access to the design, construction or maintenance data relevant to individual items of computer hardware . . . [and] no access to design of microelectronics" (*Scientific American*, April 1982).

Stanford authorities rightfully ignored the directive as an invasion of academic freedom. It was a good example of a bureaucrat who, uninformed about a technology, attempted to implement policy about that technology. All of the computer-related information in question was readily available in textbooks. Nevertheless, the incident is not trivial and could have resulted in damage to U.S.-China relations.

After the May 1983 decision by the Reagan administration, enhanced computer-performance threshold guidelines were established for routine approval of computer technology exports to China. For example, the Director of the Office of Export Administration for the U.S. Department of Commerce, in correspondence to me in 1986, stated the guidelines

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as follows:

"The general policy on exports to China is to support their technical and economic modernization and its stable development and integration into the world system, consistent with our national security concerns and multilateral obligations."

Specifically, he wrote, the U.S. government looks favorably on exports of computers with a processing rate of up to 155M bit/sec., internal memory of up to 72M bits, total bit transfer rate of 101M bit/sec., maximum bit transfer rate of any drive of up to 34M bit/sec. and a total connected net capacity of peripheral memory devices of up to 74,000M bits. "We carefully review computers that exceed these guidelines on a case-by-case basis," he notes.

Supporting China's integration into the world is certainly a sentiment shared by China's top leadership. Only a year earlier, in 1985, China's chairman of the State Science and Technology Commission addressed a gathering of the American National Academy of Sciences:

". . .In fact, our world has become a closely woven large-scale system, and no country can stay away from it. . . . I would like to imagine some decades in the future China will be inextricably involved and locked into the complicated international economic, science and technology systems of the world. At that point, no one would dare draw back from the world system into seclusion again" (*Science*, August 1985).

Nevertheless, the American export procedures for China quickly become "case-by-case" when routine guidelines are exceeded, and that means an interagency review of a license request by the U.S. Department of Defense or the State Department, for example, and possibly a review by the Coordinating Committee for Multilateral Export Controls in Paris, a process that can take six months or more.

In the state computer technology finds itself in 1986, the routine guidelines described above define a top-end, medium-scale system. Although officially China is a friendly country, it is apparent that it is still being judged.

Growing installed base

Incremental success, however, has occurred, and by the mid-1980s, a substantial amount of computer hardware from Western and Japanese sources could be found installed in China. The domestic computer industry in that country, although technologically inferior and not well organized, has been growing significantly. This could all be measured from a base of almost zero diffusion of computer technology in the late 1970s.

Some of China's leaders have even looked ahead to a time, perhaps in the first half of the next century, when China could achieve a degree of technological parity with advanced countries. But computers are part of a very dynamic technology, and, invariably, export guidelines will trail behind advances. Perhaps the general policy on exports to China is to support their technical and economic modernization, as the Department of Commerce says.

However, a representative of China's Ministry of Electronics describes the situation very differently. "Each time the U.S. wants to make a sale, it makes sure that the level of technology being transferred to us is outdated by its own standards" (*Journal of Commerce*, April 23, 1985).

A decade of progress

The years 1978 to 1987 mark a decade of real progress with China and within U.S.-China relations. The year 1978 marked the ascendancy of the Deng Xiaoping leadership and the beginnings of economic reforms,

Continued on page 77

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Teach them how to fish

BY AMY SOMMERFELD FIORE
CW STAFF

If you had two years to start a computer science department at a major university from scratch, what size staff and how much equipment would you ask for?

Try one volunteer and three donated minicomputers.

In 1985, Anthony Pau started the computer science department at China's Yunnan Normal University (YNU) with just these resources. Today, his department is headed by a dean with two division heads and 20 associate professors and lecturers.

Pau, a consultant based in Toronto, was invited by the World Bank to be a project specialist for the Chinese Provincial University Development Project. "Education is not the only factor affecting economic growth," Pau says, "but clearly, it is an essential one."

Provincial universities like YNU train the majority of the high school teachers in each province. If these teachers can be exposed to real-time industrial control and robotics, they can pass the knowledge along to their students — the factory workers and farmers of tomorrow.

"The major strides Japan has made in the growth of its industries have paralleled the development of a high level of math and science education in Japanese schools," Pau says. "It is my hope that the establishment of the computer science department at YNU will be the commencement of a new era for the Chinese government to invest more in the educational sector in China."

Pau's efforts center on industrial control applications rather than MIS, since the Chinese management style leans away from elaborate MIS systems. He also says, "Most Chinese are not fluent enough to take advantage of existing English-language MIS packages, and Chinese-language packages are not well developed."

The university's computer center houses three Digital Equipment Corp. Decsystem 20s and three Microvax IIs; the latter were loaned to YNU by the World Bank. Annexed to the main computer room is a computer experiment lab, where YNU hopes to prepare its own educational courseware.

The World Bank joined with the Chinese government to fund the development project, partly by loans, but Pau stresses the continued need for support in time and resources, particularly donations of computer equipment that might be outgrown or outmoded at a U.S. campus or corporate computer center.

"As for most developing countries," Pau says, "the use of computers to increase productivity and product quality is the key to uplift the living standard."•

Know-how

CONTINUED FROM PAGE 76

which over the course of the decade extended to both rural and urban areas, science and technology management, the constitution, the military, education and relations with other countries.

In 1979, full diplomatic relations between the U.S. and the People's Republic of China were established, and this year, American students and faculty can be found on almost every major Chinese campus.

In addition, hundreds of American businesses — including most of the prominent American computer vendors — are represented in major Chinese cities.

Driving forces

Most important, there has been a very subtle transition to the point that China is now being judged more for itself, no longer misperceived as one of the two Sino-Soviet giants. Viewed independently as a modernizing, developing country, China's potential can be seen as not ideologically but economically driven. Important to that growth process is the technological input of computers.

In 1978 in China, only four domestic producers of computers existed. All four sold computer models that, at the top end, were early third-generation — a generation, or a generation and a half, behind the West. More importantly, only a thousand or so could be found in use throughout China. In general, China's computer effort at that time was confined mostly to the laboratory.

By 1987, things have changed dramatically. China's computer industry has begun to percolate a bit. Now it is possible to count almost 40 different producers — including factories, research institutes and universities — of CPU hardware in China. However, it will probably take another decade to measure the real strength of this diversity. It is not unlike the volatility of the high density of start-ups that cropped up in Silicon Valley in the early 1980s.

Popularizing modernization

At the same time, standardization is occurring in China, and customer orientation is improving as profit-and-loss statements and foreign competition become marketplace realities. At the highest levels of official leadership, computers are becoming synonymous with "modernization," and, with the advent of microcomputers, high technology is becoming popularized even among China's grade-school

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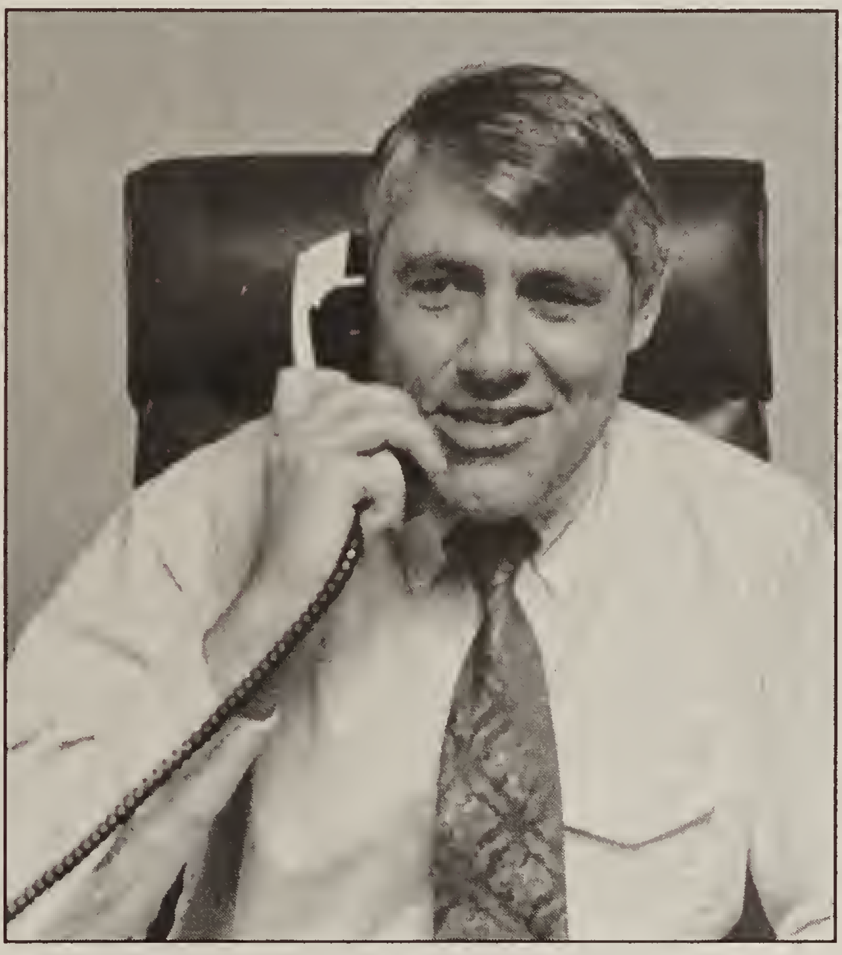
— *Phil Thomas*
Thomas Business Systems



Phil Thomas is President of Thomas Business Systems of Boca Raton, Florida. Thomas Business Systems buys, sells and leases new and used IBM, DEC and Data General equipment. They've been doing so for 10 years.

In that time, Phil has used many methods of getting his message across to buyers and sellers. He's advertised in several publications off and on. But for 10 years, he has advertised regularly (an average of once every two weeks) in *Computerworld's BUY-SELL-SWAP* section.

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Within China's industry and other infrastructural sectors, large investments are being made, especially to import foreign computer technology. We can now count at least $500 million worth of installed Western and Japanese CPUs in China's various enterprises and universities, a tribute to the degree to which Western export policy has evolved. It would be difficult to imagine an equal amount of similar technology exported to the Soviet Union.

Western export policy evolved steadily and incrementally; a revolution will occur only when export to China is governed solely by market factors on both sides and not by national security restrictions on the Western side — restrictions that imply China is still on the outside of some inner domain.

Demand for more

China has made technological progress, and progress has occurred in U.S.-China relations, but more of the same will probably be less than China would like to see in the future.

CHINA'S domestic computer technology capabilities now include widespread microcomputer cloning at the bottom end and strong third-generation architectures at the top end.

In technology transfer models, we can surmise the following about two domains: If one is using second-generation computer technology and the other has fourth-generation capabilities, and the latter transfers in full the fourth-generation technology to the former, then equilibrium will result, and the recipient will have leapfrogged a generation.

This is actually the strategy (applied in many different technologies) that developing countries like China hope to use to achieve parity with advanced countries to overcome what they perceive as their "N years" lag.

Technology dumping

Some economists who are interested in the developing world argue instead for evolutionary technology transfer as "the appropriate technology." Their opponents counter that such thinking is characteristic of technological suppression and a justification for the advanced world to dump its outdated technology.

China's domestic computer technology capabilities presently include widespread microcomputer cloning at the bottom end and strong third-generation architectures at the top end. A small number of fourth-generation capabilities have been manufactured in prototype, but the overall national computer base remains rather thin.

In addition, China has installed a substantial number and range of Western fourth-generation CPUs. However, these CPUs are not networked, and the country has not acquired any fourth-generation manufacturing know-how, for example in very large-scale integration (VLSI) technology.

On the other hand, U.S. domestic computer technology capabilities are now pervasively fourth-generation — data base management systems, VLSI, networking and others. Also, microcomputers can now be found in many American homes, and the American business that does not use automation is an anomaly.

Agrarian vs. informational

By contrast, the U.S. is described as an "information economy," with a substantial proportion of value transactions involving the processing of information. American capabilities now include fifth-generation computer technology products, which have progressed from the data processing paradigm to the knowledge processing paradigm, a substantial distance from China's still largely agrarian (70% of the population; 35% of the economy) structure.

The tension among societies that results from differing levels of technological capabilities is endemic to the human condition. In the next decade, we will have the opportunity for more mutually beneficial progress in our economic and other relations with China.

As a further benchmark we can note that in 1997, Hong Kong — a quintessential information-age city that is more attuned to international than local markets — will revert to the sovereignty of China to right the unequal treaty of a prior century.

Perhaps we should ask, "Will China become more like Hong Kong, or will Hong Kong become more like China?" The agreement signed between the People's Republic of China and Great Britain guarantees that Hong Kong's economic, social and political way of life will continue for 50 years, until 2047.

I am suggesting that in its business with China in the next decade, the U.S. should begin to think time-strategically, not in terms of quarterly reports but of commitments for cooperation into the 21st century.

What if China emerges economically similar to Japan? My preference would be for our country to be well-established in China as a participant in the Chinese economic miracle, with well-negotiated, hard-won, mutually beneficial agreements in hand. •

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TAKING CHARGE

David Ludlum

Steer session

As work crews are laboring to restore the ornate ceiling panels in the lofty lobby of New York Life Insurance Co.'s landmark 1928 headquarters, the company's MIS organization is in the midst of a $150 million effort to rejuvenate its information systems architecture.

The halfway point of the five-year undertaking, dubbed Project Steer, was the occasion for a recent briefing for three journalists over lunch in the comfortable executive dining room atop the Madison Avenue home of the 142-year-old mutual insurance company.

Steer, which stands for Strategy to Enhance Electronic Responsiveness, is a collection of initiatives for implementing up-to-date data processing systems at New York Life, which has assets of $35 billion and employs almost 10,000 people.

Steer has three goals: to create systems that are flexible and responsive to change, to move from a policy and transaction orientation to a client orientation and to make accurate, current data more readily accessible.

To date, the company has automated the collation and laser printing of policy documents and has introduced an assignment and tracking facility for individual policies. The insurer is phasing in what it calls the Client Information System and the

Continued on page 84

Phillips touts IRM

Former Marine wrestles issues at Commerce

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Reed Phillips Jr. has the kind of deep, booming voice that fills up the room — every nook and cranny — then rolls out into the hallways outside his government office. Even before you enter the office, you just know he's an ex-Marine.

Phillips spent 22 years in the Marine Corps, including service as a communications officer in the Vietnam War. After getting an MIS graduate degree, he held MIS management jobs with several military offices and later with the Federal Bureau of Investigation.

Phillips has that big-and-trim Marine build, but in other ways he doesn't fit the hard-as-nails Marine image. He has a ready smile, and he speaks with gentleness and compassion about helping employees who have problems.

The leadership qualities he developed in the military have been evident ever since, culminating in his recent election as chairman of Associated Information Managers (AIM), a professional association based in Rockville, Md.

"Reed is a real roll-up-your-sleeves kind of leader," says Sheila Brayman, AIM's executive director, commenting on why Phillips won the election.

Phillips' career has zigzagged through both the public and private sectors. He is currently director of information resources management at the U.S. Department of Commerce.

Government over private

Because he's worked at several federal agencies and as vice-president of systems engineering for American Broadcasting Companies, Phillips has an unusual ability to compare MIS jobs in the public and private sectors.

What surprises many people is that Phillips actually prefers government service — which is infamous for its red tape and low pay — to work in the private sector.

His reasoning is not so startling once you realize that Phillips hates mundane tasks and enjoys wrestling with the thorny issues that are inherent in running government information systems.

"The challenges at American Broadcasting Co. weren't half as great as they are in the government," he says.

At the Commerce Department, for example, Phillips has oversight, policy and planning responsibilities for a $476 million information technology bud-

Continued on page 88

PROFILE

Reed Phillips Jr.

Position: *Director of Information Resources Management (IRM), U.S. Department of Commerce; chairman, Associated Information Managers.*

Mission: *To implement and promote the concept of IRM.*

Tax change shakes up DP subcontractors

A tax law change has led significant numbers of computer consultants who previously worked as subcontractors to become employees of contractors or clients or to contract directly with clients, according to a recent survey.

For the survey, the Independent Computer Consultants Association (ICCA) commissioned an independent firm to poll 972 ICCA members on the effects of Section 1706 of last year's tax reform act, which the ICCA ardently opposes.

Before Section 1706 took effect earlier this year, 67% of those surveyed worked as subcontractors through a broker or technical services firm, and 33% contracted directly with clients, according to the ICCA.

By June and July, when the survey was conducted, 43% worked as subcontractors, 42% contracted directly with clients and 15% had given up their independent practices to become employees of a client, broker or technical services firm, the ICCA said in a statement released Sept. 24.

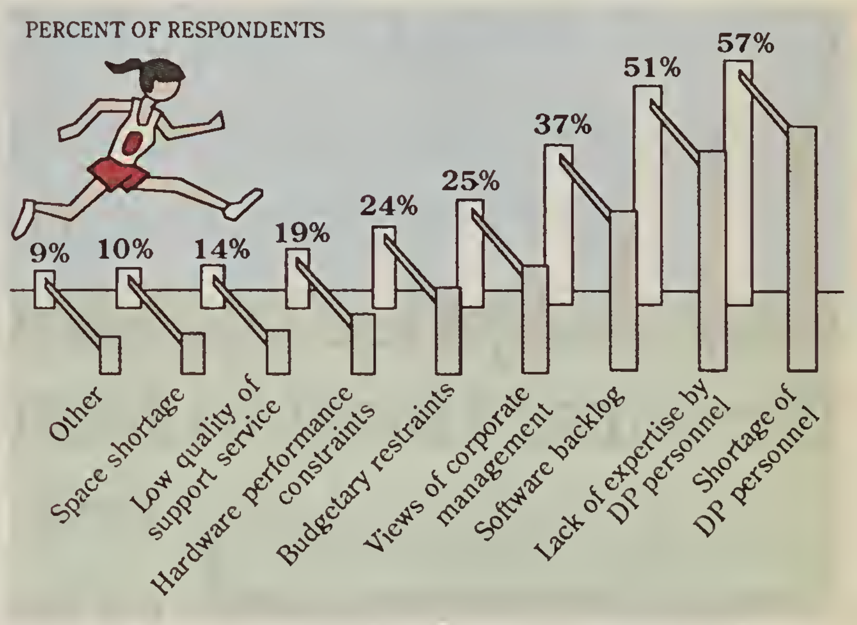
Of members who worked as subcontractors, 349 said their broker asked them to become an employee. Of these, 112 agreed while 25 refused and lost subcontracts, the ICCA said.

Section 1706 requires independent consultants in data processing and other technical fields who worked as subcontractors to become employees of a contractor or a client unless they meet standards the government uses to determine whether a taxpayer is an independent worker.

Data View

Japanese hurdles

Barriers to more rapid computerization in Japan as cited by nearly 300 MIS managers for companies listed on the Tokyo Stock Exchange



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CW CHART:AMY J. SWANSON

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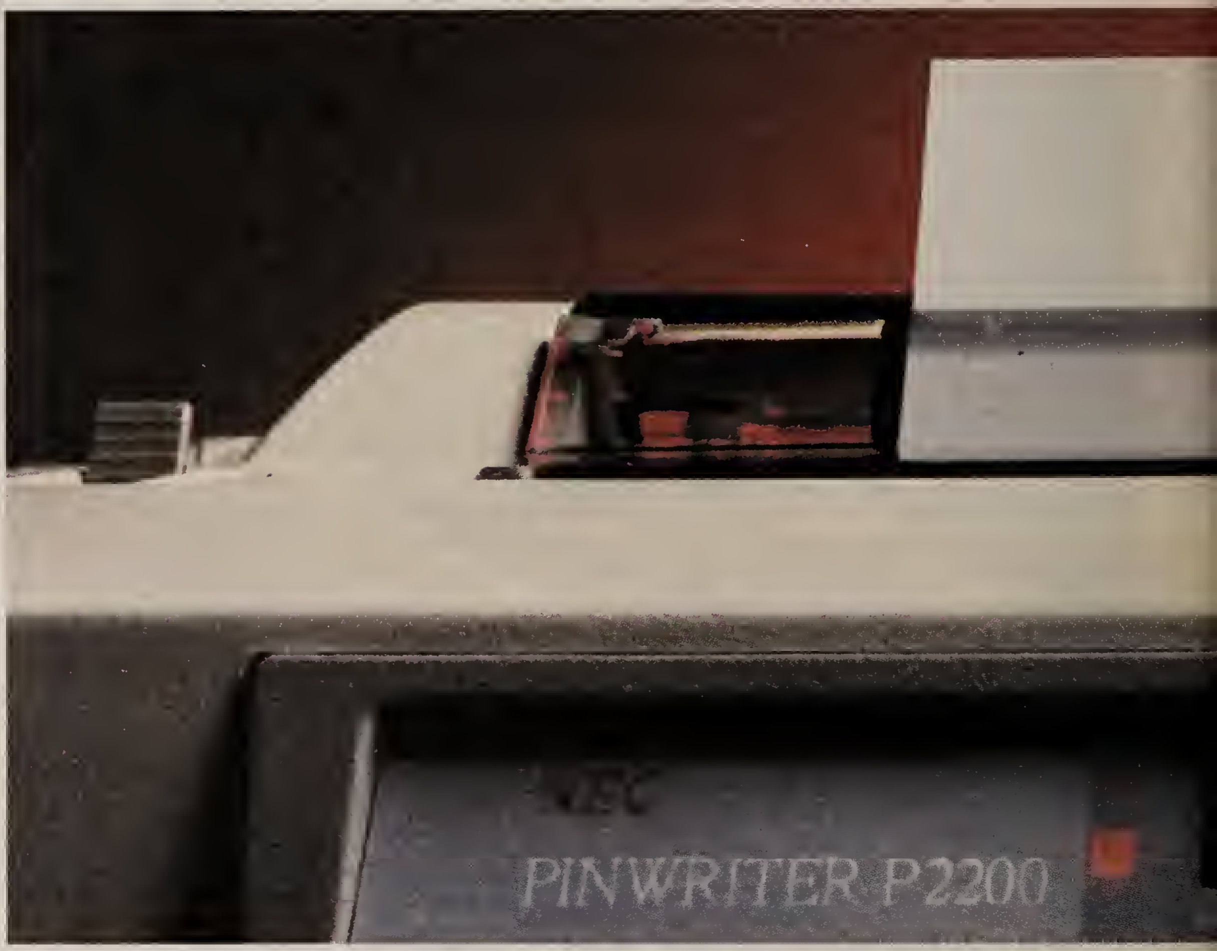

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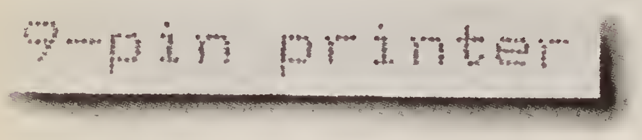
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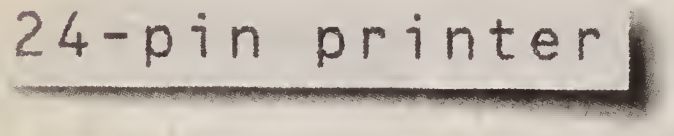
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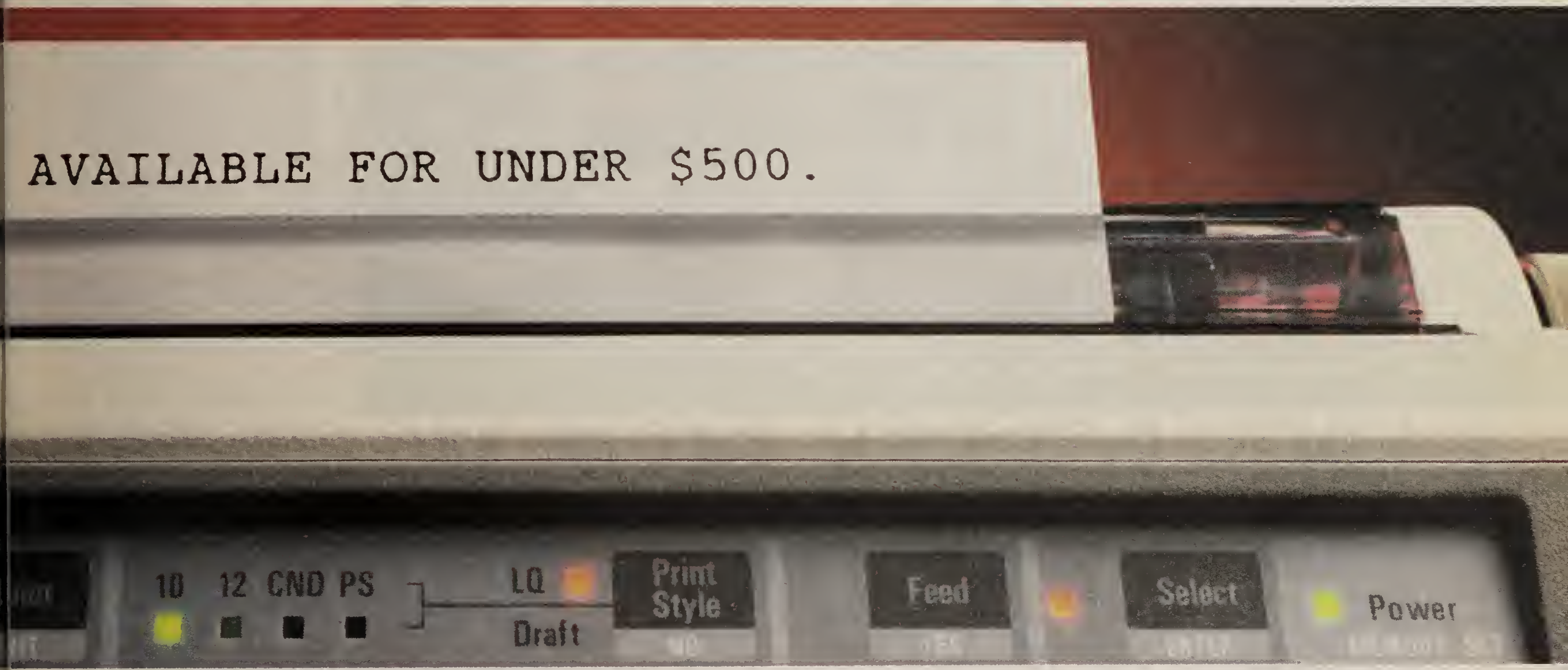

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Steer

FROM PAGE 81

Marketer System.

Michael J. McLaughlin, New York Life's senior vice-president in charge of information systems and services, said the cost of Steer is expected to fall near the top of the company's projected range of $100 million to $150 million. Previously, New York Life expected to come in near the bottom of that range.

The major reason for the current high-end expectation is an expansion of Steer's initial scope to include the $30 million Service Enhancement Projects, a collection of efforts aimed at minimizing the potential for entry of incorrect data into the Client and Marketer Systems by eliminating redundancies. Another reason for the overrun was a failure to anticipate the extent of the training and reorientation required by the company's fundamental changes in architecture and procedures, McLaughlin said.

Those changes include the adoption of Cullinet Software, Inc.'s IDMS/R data base as the cornerstone of the new architecture, the use of the Yourdon, Inc. methodology for project development and the adoption of Index Technology Corp.'s Excelerator development tool.

The installation of IDMS/R went well, but learning to use the product was difficult because the undertaking was the company's first experience with a data dictionary-driven capability, McLaughlin said. But the difficulties do not reflect poorly on Cullinet, he noted.

Similarly, the Yourdon methodology has been a real help but an additional procedure to learn, he added. "With the benefit of hindsight, we would have built in more time to allow for the assimilation of the new technology."

Assimilating the staff

Development staff members who had been working with assembler language and PL/I not only had to learn about the new environment and methods but also had to "assimilate them into their normal way of working" and gain enough experience to feel comfortable with them, said Geraldine M. Oxley, a New York Life vice-president who has been managing the day-to-day progress of Steer.

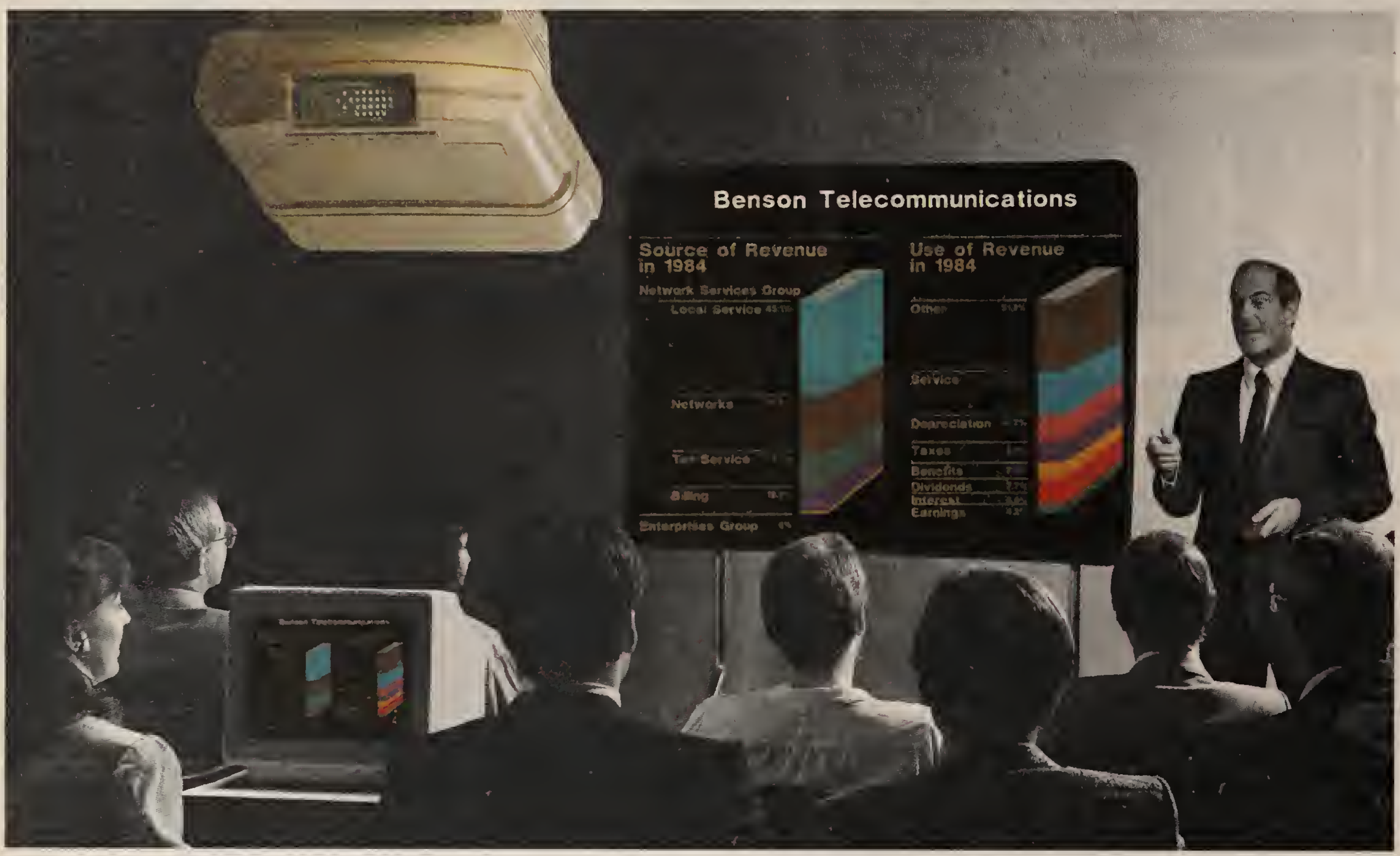
"We have been bringing these [new technologies] together so we could see how they could work together, to see how they fit in terms of someone's level of experience," Oxley said.

The educational effort has included retraining company trainers, sending staff members to classes put on by Cullinet and using some individual courseware. Oxley said it was necessary to gain some experience and knowledge before computer-based training courses could be developed.

Thomas L. Pettibone, a New York Life vice-president, noted that the company has had to maintain its existing operations and service new products while guiding Steer. Pettibone likened the process to "rebuilding the airplane while it's in the air. . . . We have to make sure we can go to the street with a new offering and support it. Steer is vitally important as a strategic tool, yet we must be sure that we protect our asset base as it exists today."

If it sounds as though the people at New York Life have taken on all they can handle, that does not seem to be the case. McLaughlin and his crew are preparing a proposal to ask the company's directors to provide another $40 million to advance the company's timetable for replacing its 20-year-old Centralized Transaction Processing System.

Ludlum is *Computerworld's* senior editor, management.



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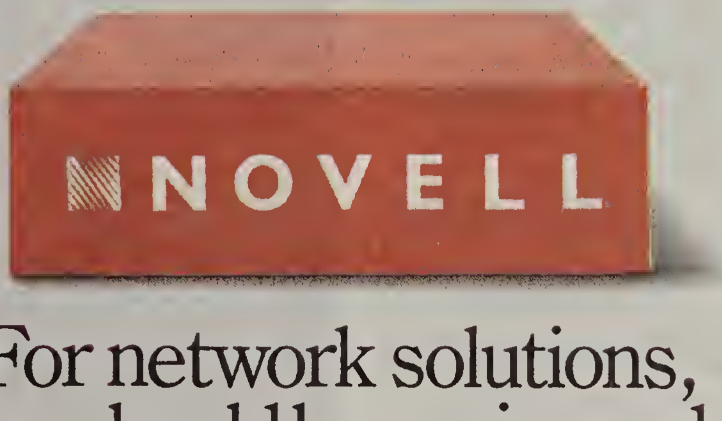

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Phillips

CONTINUED FROM PAGE 81

get that includes such diverse organizations as the U.S. Bureau of the Census, the Patent and Trademark Office, the National Bureau of Standards, the International Trade Administration and the National Weather Service.

In addition to the sheer magnitude of the job, there are complex and politically sensitive issues concerning the dissemination of Commerce Department information, the use of supercomputers, computer security and the government's notorious competitive procurement process.

'Do things right'

Furthermore, Phillips represents the department in dealings with the inspector general, congressional subcommittees and auditors who scrutinize every decision about information systems.

With an army of auditors who are looking over your shoulder, Phillips points out, "it makes you do things right, right from the start.

"From my vantage point, having worked in both sectors and talked with colleagues, I feel I have a job that is at least as challenging as they do as corporate vice-presidents or chief information officers," he says.

For the 53-year-old Phillips, the typical day includes 10 hours at the office, starting at 6:30 a.m. so he can get some work done before the regular round of meetings and telephone calls begins.

He tries to alleviate the stress through exercise, weekend getaways and vacations at his condominium in Virginia Beach, Va.

On the job, Phillips finds that the best way to solve problems is to develop two-way communication with his staff and with other agencies.

"So many times in the federal government, problems remain and fester without solutions because no one is willing to negotiate and talk about them," he says.

Dictatorial side

One thing he dislikes about the private sector is that management can be very dictatorial.

"Rather than unilaterally laying out a program, I like to hammer it out by working with my people, my staff," he says.

Ralph J. Hurd, director of computer services at the Commerce Department, says Phillips' management style is one of setting goals and expecting the staff to meet those goals.

"He has a very clear picture in his head of what he wants to happen," and he methodically plots the steps needed to reach the goal, adds Brayman of AIM. But if some of the steps falter, "he has a tendency to get short-tempered and frustrated," she says.

Hints of discouragement

For all of his praise of government work, Phillips hints that he has become discouraged about some aspects of the job.

One frustration is being unable to reward and keep his most talented staff members due to government personnel and salary restrictions.

"I'm losing an outstanding telecommunications specialist [to the private sector] because I couldn't promote him," Phillips complains.

Government challenges

Reed Phillips Jr., director of information resources management at the U.S. Department of Commerce, lists some of the major challenges he faces:

- Administrative systems. "We are now pulling together our eight accounting systems into one system. In the private sector, usually they are set with one system, and [they] aren't faced with this."
- Supercomputers. "We're heavy users of supercomputers. I'm chairing a task force to look at the future direction the department should take."
- Public information. "Commerce has a lot of information in its data bases, information that is perishable but very valuable.

  "We've formed a task force to struggle with complex issues of information dissemination. These are issues that take a lot of negotiation and cooperation."
- Competitive procurement. "When I was at American Broadcasting Co., we just had to sell the board that we needed to upgrade the computers. The board didn't care how we did it.

  "In the government, we take on the added dimension of caring how you do it; it must be through a competitive process."
- Oversight. "All the way down the line, controls and scrutiny in government are much stronger than the controls in the private sector. I communicate daily with our inspector general and frequently with the Office of Management and Budget, General Accounting Office and House Government Operations Committee."

MITCH BETTS

His biggest frustration, however, is watching the Reagan administration dismantle the information resources management (IRM) offices in agency after agency.

Phillips is a leading proponent of the IRM concept, which holds that data processing, office automation, communications, records management, libraries, micrographics and all other information programs should be managed in an integrated fashion.

The IRM philosophy was mandated for the federal government by the Paperwork Reduction Act of 1980, one of the last acts of the Carter administration. Phillips was the first federal official to implement the concept, when he was director of IRM at the U.S. Department of the Interior in the early 1980s.

"I don't think this [Reagan] administration ever really supported IRM," Phillips says. "Now we're seeing a deterioration of the IRM concept, which is unfortunate because it's a damn good concept. At the Department of Interior, they've dismantled the organization I put together. Here [at Commerce], I've lost a big chunk: the records management and paperwork responsibility.

"That, if anything, might drive me back out to the private sector," he says.

Bringing IRM to both sides

In any case, Phillips is likely to use his new position as chairman of AIM to promote the IRM philosophy in both the government and the private sector, according to AIM's Brayman.

Phillips has been a leader in several other MIS organizations, including past president of the Society for Information Management and past chairman of the Association of Federal Information Resources Management. He obviously believes it is important for information managers — including those in government — to become involved in professional associations.

By networking with peers in other organizations, he says, MIS managers can help each other solve mutual problems. "It's like getting free consulting advice.

"Many in government don't get involved, but that's unfortunate because it makes their outlook much more narrow," he adds.

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"ISDN provides an information outlet to every workstation, thereby eliminating time-consuming and costly wiring, as well as enhancing messaging and network control capability."

Thanks to ISDN, McDonald's will enjoy better customer service, more current market information, better tracking of product promotions, more efficient inventory control, and reduced administrative workloads.

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As we are doing for McDonald's, AT&T and your telephone company can help your business realize the networking efficiencies and cost savings of ISDN. To find out all that ISDN can do for you, write on your business letterhead to: AT&T Network Systems, P.O. Box 1278, Room 2966, Morristown, N.J. 07960-1278.

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OCT. 11-17

Software Publishers Association's Third Annual Conference: Exploring New Frontiers in Software. Cambridge, Mass., Oct. 11-14 — Contact: SPA, Suite 901, 1101 Connecticut Ave. N.W., Washington, D.C. 20036.

Society for Information Management's 19th Annual Conference. Seattle, Oct. 11-15 — Contact: Kathleen Niles, SIM Headquarters, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

National Retail Merchants Association Conference for Operations, Distribution and Transportation. St. Louis, Oct. 11-15 — Contact: NRMA, 100 W. 31 St., New York, N.Y. 10001.

Smart Card Applications and Technologies Conference. Atlantic City, Oct. 12-14 — Contact: The Information Exchange, Suite B, 15269 Mimosa, Dumfries, Va. 22026.

FMS '87: Flexible Manufacturing Systems. Long Beach, Calif., Oct. 12-15 — Contact: Special Programs Division, Computer and Automated Systems Association/Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

USE, Inc. Fall Conference (for Unisys Corp. Series 1100 users). Montreal, Oct. 12-16 — Contact: USE, Inc., Box 461, Bladensburg, Md. 20710.

Systems for Manufacturing Excellence '87. Long Beach, Calif., Oct. 12-16 — Contact: Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

IBM at the Crossroads: Rebuilding for the Future. San Francisco, Oct. 13 — Contact: Diane Szretter, International Data Corp., P.O. Box 9015, 5 Speen St., Framingham, Mass. 01701.

Vax Users Show, Exposition and Conference. Dallas, Oct. 13-14 — Contact: The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

PC Expo. Chicago, Oct. 13-15 — Contact: PC Expo, 333 Sylvan Ave., Englewood Cliffs, N.J. 07632.

Scan-Tech 87. Kansas City, Mo., Oct. 13-15 — Contact: Automatic Identification Manufacturers, Inc., 1326 Freeport Road, Pittsburgh, Pa. 15238.

Chem Cam '87. New Orleans, Oct. 13-16 — Contact: Devon Buckler, The Synthetic Organic Chemical Manufacturers Association, Suite 300, 1330 Connecticut Ave. N.W., Washington, D.C. 20036.

RDB Expo '87. San Francisco, Oct. 13-16 — Contact: Registrar, The Relational Institute, Suite 106, 6489 Camden Ave., San Jose, Calif. 95120.

System 3X Users Exposition and Conference. Atlanta, Oct. 14-15 — Contact: Systems 3X Users Show, The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

Second National Conference on Building and Operating Defect-Free Software. San Francisco, Oct. 14-16 — Contact: Quality Assurance Institute, 9222 Bay Point Drive, Orlando, Fla. 32819.

Fifth Biennial IEEE Careers Conference: The Engineer's Life and Career in Today's World. San Diego, Oct. 14-16 — Contact: William R. Anderson, Institute of Electrical and Electronics Engineers, Suite 608, 1111 19th St. N.W., Washington, D.C. 20036.

Solutions for Today: TOP and GOSIP Profiles. Washington, D.C., Oct. 15-16 — Contact: Rebecca L. Alsup, Technical Activities Division, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Northeast Computer Faire. Boston, Oct. 15-17 — Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

Printcam. Boston. Oct. 16-18 — Contact: Key Productions, Inc., 234 Murphy Road, Hartford, Conn. 06114.

OCT. 18-24

Techskills. Cincinnati, Oct. 18-21 — Contact: American Society for Training and Development, Box 1443, 1630 Duke St., Alexandria, Va. 22313.

Hammer Forum 87 — Strategic Information Systems: The Technological Dimension. Cambridge, Mass., Oct. 19-21 — Contact: Hammer Forum 87, Hammer and Co., 5 Cambridge Center, Cambridge, Mass. 02142.

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LOCAL HAPPENINGS

NORTHEAST

Waltham, Mass., Oct. 14. Association for Systems Management (ASM), Bay State Chapter. Merging Natural Languages and Artificial Intelligence Systems, with Robert Goldman of Artificial Intelligence Corp. Best Western TLC. 5:30 p.m. Contact: Sue Denison, 36 Brooks Ave., Newton, Mass.

West Hartford, Conn., Oct. 15. Black Data Processing Associates, Hartford Chapter. Voice and Data Integration. Hartford Insurance Group, 235 Fern St. 5:30 p.m. Contact: BDPA, P.O. Box 2522, Hartford, Conn. 06146.

Boston, Oct. 21. Data Processing Management Association (DPMA), Boston Chapter. Facilitator-based Information Gathering, with Jerry Erwin of Technology Information Products Corp. Anthony's Pier 4 Restaurant. 5:30 p.m. Contact: DPMA, P.O. Box 1806, Boston, Mass. 02105.

Augusta, Maine, Oct. 21. DPMA, Maine Pine Tree Chapter. People Skills, with Sally Harwood of the University of Maine. The Senator Inn. 5 p.m. Contact: J. Fieweger, Delta Chemicals, Inc., Searsport, Maine 04974.

Washington, D.C., Oct. 22. Black Data Processing Associates, Washington, D.C., Metropolitan Area Chapter. Tax Forum for Independent Consultants, with Connie Austin of Cadra Services, Inc. Ramada Renaissance Hotel, 1143 New Hampshire Ave. N.W. 6:30 p.m. Contact: BDPA, P.O. Box 2420, Washington, D.C. 20013.

SOUTHEAST

Chamblee, Ga., Oct. 13. ASM, Atlanta Chapter. Robotics: Today and Tomorrow, with Les Ottinger of Advanced Manufacturing Systems, Inc. Holiday Inn Chamblee-Dunwoody, 4386 Chamblee-Dunwoody Road. Contact: Jane Roberts, HBO & Co., 1 Ravinia Drive, Atlanta, Ga. 30346.

Charlotte, N.C., Oct. 15. ASM, Queen City Chapter. Productivity in Systems Development, with Olin Broadway of Broadway & Seymour. Cosmos Steak House, 5100 E. Independence Blvd. 6 p.m. Contact: Robert Yearwood, Metro Information Services, Suite 140, 7 Parkway Plaza, Charlotte, N.C. 28217.

Macon, Ga., Oct. 20. DPMA, Middle Georgia Chapter. Stress Management, with Nancy Ridley of Charter Northside. Holiday Inn, Interstate 75. Contact: L. L. Purcell, P.O. Box 4, Macon, Ga. 31202.

Lafayette, La., Oct. 22. DPMA, Acadiana Chapter. Monthly meeting. Evangeline Steak House, Highway 167 S. 6:30 p.m. Contact: Debra Billeaud, Guaranty Bank and Trust Co., Fourth Floor, 200 W. Congress St., Lafayette, La. 70502.

MIDWEST

Minneapolis, Oct. 8. The Minnesota Intellectual Property Law Association. Software Copyright Infringement: The Emerging Standard. Whitney Hotel, 150 Portland Ave. 1 p.m. Contact: Walter Linder, Suite 1500, 625 4th Ave. S., Minneapolis, Minn. 55415.

Des Moines, Iowa, Oct. 12. ASM, Des Moines Chapter. (Bosses' night). Constructive Methods of Conflict Resolution and Motivation of DP Professionals, with Roy Park, management consultant. The Howard Johnson Inn, Merle Hay Road. 5 p.m. Contact: Integrated Resources Life Insurance Co., 3737 Westown Pkwy., West Des Moines, Iowa 50265.

Kalamazoo, Mich., Oct. 14. DPMA, Southwestern Michigan Chapter. Taking the Disaster Out of Disaster Recovery, with Scott Sarison of Corporate Contingency Services. The Black Swan Restaurant. 6:30 p.m. Contact: William Hosken, The Upjohn Co., 7171 Portage Road, Kalamazoo, Mich. 49001.

Toledo, Ohio, Oct. 14. ASM, Toledo Chapter. Selling Ideas and Change to Management, with Ken J. Shoa of Executive Support Systems. Heatherdowns Country Club. 5:30 p.m. Contact: Computer Services, Marathon Oil Co., 539 S. Main St., Findlay, Ohio 45840.

Indianapolis, Oct. 15. Association for Computing Machinery, Central Indiana Chapter. Artificial Intelligence in the Real World, with Jim Crosby of GTE MTO, Inc. Howard Johnson Downtown, 501 W. Washington St. 6 p.m. Contact: Don Boner, 957 West Drive, Woodruff Place, Indianapolis, Ind. 46201.

Dayton, Ohio, Oct. 20. ASM, Megacity Chapter. Computer Security and Business Concerns. Dayton Marriott, 1414 S. Patterson Blvd. 5:30 p.m. Contact: S. Beebe-Owen, Western Ohio Pizza, Inc., 2324 Stanley Ave., Dayton, Ohio 45404.

Fort Wayne, Ind., Oct. 20. ASM, Fort Wayne Chapter. A View from the Top, CEO, CFO, with Walter S. Ainsworth of Phelps Dodge and Randolph Straka of Tokheim. Goeglein's, 7311 Maysville Road. Contact: Beth Hukill, ASM, Suite 103, 10427 Leo Road, Fort Wayne, Ind. 46825.

Southfield, Mich., Oct. 21. DPMA, Detroit Chapter. MAP and Factory Communications, with Raymond A. Westbrook of Electronic Data Systems Corp. Ramada Inn, 28225 Telegraph Road. 5:30 p.m. Contact: Management Recruiters, Suite 285, 30300 Telegraph, Birmingham, Mich. 48010.

WEST

Stockton, Calif., Oct. 13. DPMA, Central Valley Chapter. Information Management in the FBI. Prime Rib Inn, 1025 Robinhood. 7 p.m. Contact: Bob Lombardi, DPMA, P.O. Box 4122, Stockton, Calif. 95204.

Portland, Ore., Oct. 19-20. Effective Software Practices: The Fifth Annual Pacific Northwest Software Quality Conference. Sheraton Inn, Airport. Contact: Lawrence & Craig, Inc., P.O. Box 40244, Portland, Ore. 97240.

Walnut Creek, Calif., Oct. 21. ASM, East Bay Chapter. Monthly meeting. Contact: ASM, 32 Robert Road, Orinda, Calif. 94563.

El Paso, Texas, Oct. 22. DPMA, El Paso Chapter. Disaster Recovery (Bosses Night). International Club, Mbank Tower. 5:30 p.m. Contact: Steve Tarro, Las Cruces, N.M.

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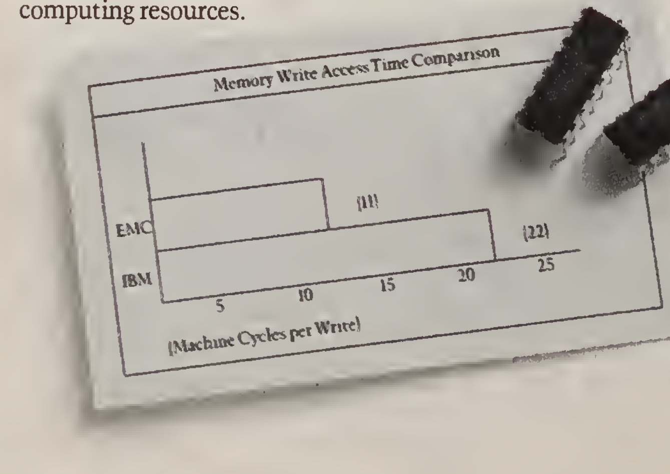

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COMPUTER INDUSTRY

INDUSTRY INSIGHT

Clinton Wilder

Where the action is

Never mind SQL implementation. The true test for any new relational data base management system should be how well it can sort out data on the competitive landscape in the data base software industry.

The criteria are perfect. The data needs to be constantly updated in real time. The relationships among various entries are rapidly changing. And an entry that might have been happily ensconced in the table of IBM mainframe data base companies now needs to be reclassified and added to the mid-range chart.

If you're looking for excitement, challenge and potential rocket-like growth in the software vendor world, this is the place to be. Just ask Oracle.

It is also the place where yesterday's rockets have plummeted back to earth. Just ask Cullinet.

It is a market in which one player may be rolling over its traditional competitors, only to get its doors blown off by some new vendor that no one even heard of two years ago.

In the words of Charlotte Walker, software analyst for L. F. Rothschild & Co., "Nothing will remain the same, and a tumultuous time ahead should be anticipated."

That, if anything, is an understatement. The market and technology forces at work in the data base industry today have the potential not only to spur consolidation (which, to a large extent, has already occurred), but also to cloud forever the distinctions among software market segments.

What has caused this massive upheaval? Simply put, virtually all of the fundamental changes in the way corporate America approaches its information systems have converged on the data base software market in a very compressed time frame. Among them are the following:

- Distributed processing.
- Computer-integrated manufacturing.

Continued on page 96

GSA opens up telecom bidding

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. General Services Administration (GSA), caving in to congressional demands, recently agreed to split in two the procurement of a $4.5 billion private network for the federal government, called Federal Telecommunications System (FTS) 2000.

One result of the GSA decision is that the bidding team of Electronic Data Systems Corp. (EDS) and U.S. Sprint Communications Co. is expected to reenter the hard-fought bidding contest. Two other heavyweight teams, one led by AT&T and the other led by Martin Marietta Corp., are also bidding.

The EDS-Sprint team pulled out of the bidding contest earlier this year, citing the numerous regulatory delays and uncertainties of the procurement. Analysts said the EDS-Sprint team saw little chance of winning the whole FTS 2000 contract [CW, June 22].

The GSA suspended bidding on the contract just a few days before bids were due on Sept. 30, which sent officials and vendors back to the drawing board to figure out how to split the contract between two prime contractors and reopen the bidding.

A GSA spokesman said it is unclear whether the present Request for Proposals (RFP) will be amended or whether a whole new RFP must be written. In either case, new bidders would be allowed to enter the fray.

Key members of Congress had argued against GSA's winner-take-all approach to the contract [CW, Aug. 10 and 31]. Among the critics were Reps. Jack Brooks (D-Texas) and Glenn English (D-Okla.) and Sens. John Glenn (D-Ohio) and David Pryor (D-Ark.).

The EDS-Sprint team reportedly lobbied Brooks to push for a multivendor approach, which would give the team a better chance of winning at least a piece of the lucrative contract.

Splitting the contract is intended to increase competition and prevent the government from being locked into a single vendor. The GSA, however, had argued that a single prime contractor would be easier to manage.

Playing politics

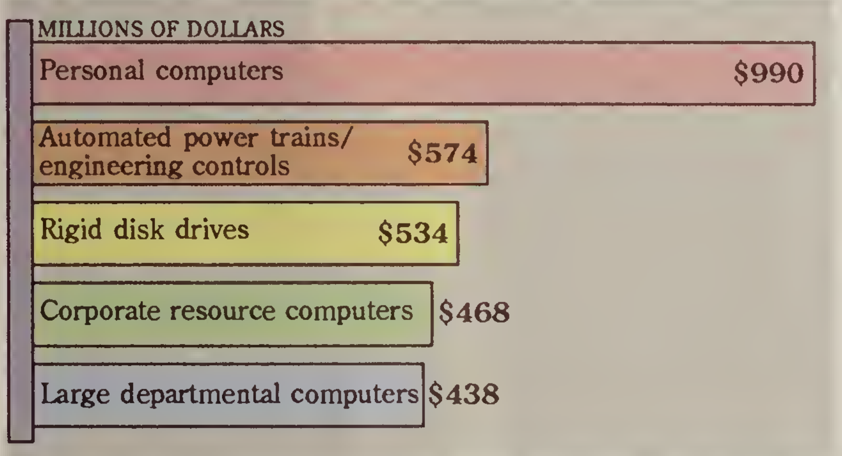
GSA Administrator Terence C. Golden made it clear that the decision to split the contract was based on politics. In a letter to Brooks, the powerful chairman of the House Committee on Government Operations, Golden wrote: "We are taking this action because we do not believe the procurement can be success-

Continued on page 94

Data View

PCs are top chip users

The five leading North American markets for semiconductors, 1987



INFORMATION PROVIDED BY DATAQUEST, INC.
CW CHART

AT&T sued; tampering alleged

BY STEPHEN JONES
CW STAFF

IRVINE, Calif. — Doelz Networks, Inc. recently charged that AT&T and three of its technical consultants "encouraged and induced" Bank of America to breach a $20 million contract it signed with Doelz in August 1986.

In a $25 million lawsuit filed in Orange County Superior Court, Doelz, a data network systems vendor, charged AT&T with unfair competition and misappropriation of trade secrets that AT&T allegedly used to beat out Doelz for the lucrative contract.

According to the suit, the contract involved a data transport system that Doelz had agreed to install for Bank of

Continued on page 96

Inside

- Foreign firms invest in Japanese technology despite strong yen. Page 94.
- Arrow shells out $40M for Ducommun. Page 94.
- Smartech Systems acquires CFS, Inc. mainframe system software. Page 95.

Avanti names ex-Telenet exec Taylor president

Appointment seen as part of T1 switch vendor's push into Fortune 500 hybrid net market

BY ELISABETH HORWITT
CW STAFF

NEWPORT, R.I. — Seeking to accelerate its drive to provide integrated private and service-based network systems, T1 switch vendor Avanti Communications Corp. recently chose former Telenet Communications Corp. Senior Vice-President Tom Taylor as its new president.

Prior to his position with Telenet, Taylor was president of Uninet, a value-added network provider that became part of Telenet in 1986; prior to that, he was with GTE Corp.

Taylor's experience with value-added network providers and with GTE's independent telephone company division meshes well with Avanti's competitive strategy, which is "offering the best solution for both public and private T1 networking," the executive claimed.

Avanti has for some time been positioning itself to serve the growing Fortune 500 market for such hybrid networks by designing its T1 switches to interface with carrier-based services such as AT&T's Digital Access and Cross-Connect Systems, or DACS, and Accunet offerings, Taylor pointed out.

Filling T1 niche

Avanti will provide transmission and management equipment that will fill large companies' needs to combine private T1 networks for major sites with carrier-based services for remote sites that "cannot justify T1 switches from a maintenance and service point of view," Taylor said.

Tom Taylor

Hybrid networks "are the most natural implementation path for these companies," particularly since the carriers will soon be announcing new sub-T1 data communications offerings, he added.

Taylor said he is "not running away from anything" by leaving Telenet, the Reston, Va.-based value-added network subsidiary of U.S. Sprint Communications Co. "They are profitable and way ahead of plan this year," he said.

Taylor added that he anticipates 100% annual revenue growth for Avanti. Avanti had 8% of the T1 switch market in 1986, according to a study by Boston-based research firm The Yankee Group.

On the heels

Taylor's appointment followed closely on the August hiring of Daniel Gatti as the new senior vice-president of sales, marketing and service at Avanti.

Gatti was vice-president of GTE/Siemens Transmission Systems and, prior to that, a vice-president of product management for GTE Communication Systems.

Avanti also recently hired Philip Herres, formerly an engineer with Northern Telecom, Inc.

Japanese technology lures foreign investors

Strong yen fails to discourage U.S., European firms; R&D sites burgeoning

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — Gaining access to Japanese technology is becoming a more important factor driving investment by foreign companies in Japan, according to a report issued by management consultants Booz, Allen & Hamilton, Inc. here last week.

More than one-third of the manufacturing companies polled conduct research and development in Japan, and 20 of the R&D sites were set up over the past few years, according to Booz, Allen. Eighty percent of the companies said they are planning to increase their level of Japanese manufacturing despite the strong yen, which raises production and labor costs.

The Booz, Allen study, conducted with ASI Market Research, Inc. in Japan, polled 400 companies, including about 200 U.S. firms and 133 European concerns.

The total industrial investment by foreign firms in Japan was $935 million in 1986, more than double 1981's $432 million, according to Japan Ministry of Finance figures included in the study.

U.S. companies are the largest foreign investors in Japan, accounting for 49% of the total cumulative investment through 1986. Europe is the second largest investor, with 24%.

Subsidiaries catch on

Many companies investing in Japan now are doing so by setting up wholly owned subsidiaries rather than through licensing their technology through joint ventures with Japanese partners. Direct subsidiaries lessen the need for the trading companies that were popular distribution mechanisms for firms like IBM Japan Ltd., Nihon Digital Equipment Corp. and Wang Computer Ltd., among others, when they first started in the Japanese market.

Thomas F. Jordan, vice-president of Du Pont Japan Ltd., said the Japanese companies most able to help offshore partners are most likely their competitors as well. "The risk is that their technology goes off to the Japanese company that handles their distribution," Jordan said. "New high-technology companies are less likely to share their technologies with joint ventures."

Telecommunications companies, however, were specifically mentioned in the report for raising their Japanaese investments by a slower rate than other industries.

Arrow pays $40M for Ducommun

LOS ANGELES — In a major consolidation of two computer system and peripheral distribution firms, Arrow Electronics, Inc. recently signed a definitive agreement to acquire Ducommun, Inc. and its subsidiaries for some $40 million.

Ducommun is a distributor for AT&T's 3B minicomputer and 6300 microcomputer series as well as NEC Corp.'s printers and Control Data Corp. and Seagate Technology, Inc. disk drives.

Fred Bailard, Ducommun senior vice-president and general counsel, said the two companies will have sales volume of about $1 billion a year.

The two companies' distribution networks will be integrated, although little product overlap is expected and there are no plans to discontinue existing product lines, Bailard said.

Telecom bids

CONTINUED FROM PAGE 93

ful without your support, and it is evident we cannot reach a consensus on the best way to proceed."

The key question is how the GSA will split the contract between two prime contractors, analysts said.

"How will they assure interconnectivity between the two networks, and who will be responsible for managing the interfaces?" asked Dennis Oldson, vice-president of Telesynetics Corp., a Fairfax, Va.-based consulting firm that helped the GSA draft the original RFP.

Splitting the contract will put the GSA back in the position of having to manage multiple network vendors, as it does now, Oldson said.

The delays in the procurement, as well as the higher overhead costs of managing two prime contractors, may prompt federal agencies to abandon the FTS 2000 network in favor of running their own networks, Oldson added.

The FTS 2000 project is intended to provide federal agencies with a high-speed, intercity network for data and voice traffic.

Oldson said the GSA may try to find a way for all three bidding teams to get a piece of the FTS 2000 contract. "That's good for GSA politically, but it's not good for the users," he said.

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Smartech buys system tools

Acquires DOS/VSE, VSE/SP utilities from CFS

DALLAS — Smartech Systems, Inc. recently announced that it has acquired IBM mainframe system software products from CFS, Inc. in West Roxbury, Mass.

According to Smartech, CFS specializes in IBM mainframe system software for the DOS/VSE and VSE/SP operating environments.

The acquired products include Display Operator Console Support (DOCS), a console manager, and Helpvtoc, an IBM VSAM/VTOC utility.

DOCS, first introduced in 1975, has an installed customer base of 400 installations worldwide, according to David Shepherd, marketing manager for Smartech.

Helpvtoc, which was introduced in December 1986, has shipped more 700 trials in its first nine months, according to Shepherd.

Eric L. Vaughan, president of Smartech, said his firm will provide product support and service for the CFS software.

In addition, Vaughan said, Smartech will introduce some technical enhancements.

NICKELS & DIMES

Software AG Systems, Inc. announced revenue for the first quarter ended August 31 of $17.2 million, compared with $15.4 million a year ago. Profits were $1.3 million, or 22 cents per share, compared with $1.1 million, or 19 cents per share, in the previous year.

Capital Associates, Inc. announced revenue for the year ended May 31 of $33 million, compared with $20.1 million in the previous year. Profits were $10.2 million, or $1.25 per share, compared with $7.6 million, or $1 per share, the previous year.

For the fourth quarter, revenue was $12.3 million, compared with $4.7 million a year ago. Profits were $2.6 million, or 27 cents per share, compared with $1.8 million, or 23 cents per share, in the like period a year ago.

Micropro International Corp. announced revenue for the fourth quarter ended Aug. 31 of $12.3 million, compared with $10.5 million a year ago. Profits were $781,000, or 6 cents per share, compared with a loss of $342,000, or 3 cents per share, in the corresponding period a year ago.

For the year, the company announced revenue of $41.3 million, compared with $38.2 million in the previous year. Profits were $2.9 million, or 22 cents per share, compared with a loss of $1.2 million, or 10 cents per share, in the prior year.

Automatic Data Processing, Inc. reported revenue for the fourth quarter ended June 30 of $355.3 million, compared with $318.6 million in the previous year. Profits were $40 million, or 52 cents per share, compared with $30.1 million, or 42 cents per share, in the like period a year ago.

For the year, revenue was $1.4 billion, compared with $1.2 billion in the previous year. Profits were $132 million, or $1.76 per share, compared with $106 million, or $1.45 per share, a year ago.

Floating Point Systems, Inc. reported revenue for the third quarter ended July 31 of $18.3 million, compared with $20.8 million in the like period a year ago. The company reported a net loss of $12.4 million, or $1.41 per share, compared with a net loss of $2 million, or 23 cents per share, in the like period a year ago.

System Software Associates, Inc. reported net income for the third quarter ended July 31 of $1 million, or 20 cents per share, compared with $325,000, or 8 cents per share, in the previous year. Revenue was $8.6 million, compared with $3.5 million in the corresponding period a year ago.

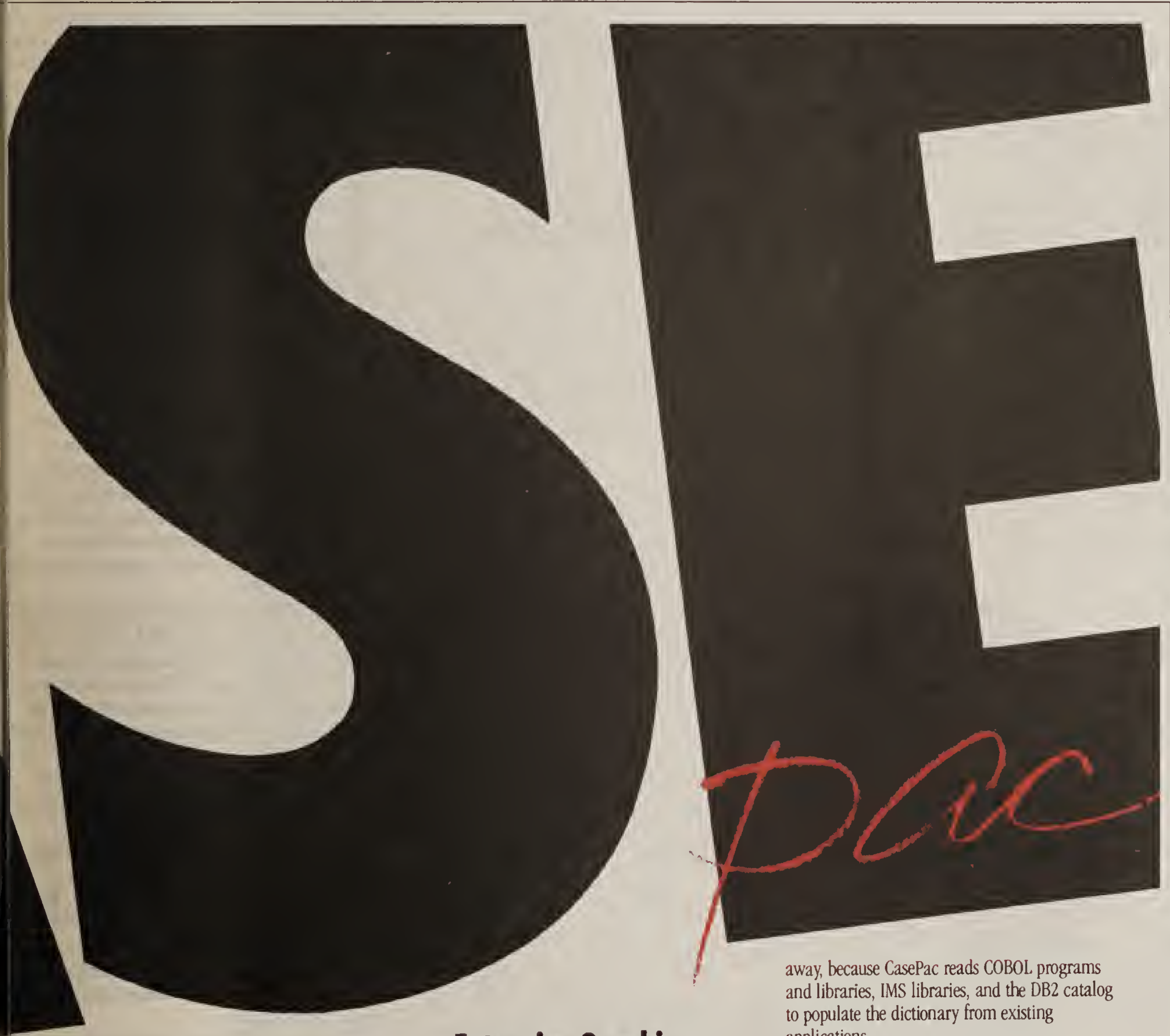
Adobe Systems, Inc. announced revenue for the third quarter ended Aug. 31 of $9.9 million, compared with $4.9 million in the previous year. Profits were $2.3 million, or 22 cents per share, compared with $1.2 million, or 13 cents per share, in the like period a year ago.

Symbolics, Inc. reported revenue for the year ended June 30 of $103.8 million, compared with $114.2 million a year ago. Net loss was $25.5 million, or 99 cents per share, compared with net income of $10.7 million, or 41 cents per share, a year ago.

For the fourth quarter, revenue was $29.2 million, compared with $31.7 million a year ago.

The net loss was reported as $1.5 million, or 6 cents per share, compared with net income of $1.7 million, or 7 cents per share, in the prior year.

Included in the fiscal 1987 results were one-time charges of $13.7 million, representing estimated costs of a restructuring program, established in September 1986, to consolidate the company's office and manufacturing space, reorganize management and reduce the work force by approximately 17%.



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AT&T sued

CONTINUED FROM PAGE 93

America's 1,051 branches.

Doelz said AT&T meddled in the contract after three of its consultants learned confidential and proprietary details about the Doelz system.

The consultants — identified as Robert Wright, Janet Sowolla and Lynn Seippel — were given access to the information because AT&T was coordinating the installation of a telephone system for the data transport network, according to the filing.

Part of that information included the price of the data transport system and how Doelz felt it could be improved. Armed with those details, Doelz charged, AT&T convinced Bank of America that it could provide a better data transport system.

Bank of America, which would not comment on its dealings with Doelz, broke off its talks with Doelz in late September 1986 and went on to award the contract to AT&T, the filing states.

Rash of charges

The suit additionally charges AT&T and the three consultants with inducing breach of contract, interfering with prospective economic advantage, breach of fiduciary duty and violation of the Uniform Trade Secrets Act and the Business and Professional Code.

AT&T officials would not comment on the suit.

Doelz claimed Bank of America agreed in writing to accept Doelz's offer after the company had designed a system for the bank and provided it with an installation schedule and pricing information. Doelz said it incurred expenses when it hired additional employees to work on the contract and purchased related equipment and materials.

Eight-year-old Doelz specializes in transport data networks for organizations, such as financial institutions and manufacturing operations, with multiple networking requirements.

Doelz is trying to recoup the $20 million it expected to earn in goods and services from the contract plus a minimum of $5 million in damages.

The action

CONTINUED FROM PAGE 93

- The rise of the minicomputer, resulting in DEC's market success and IBM's 9370 development.
- The emergence of Unix.
- Users' decisions to install systems from multiple hardware vendors, with the associated connectivity headaches.
- The introduction of much more powerful micros and the file servers around which they are grouped.
- The networking that (hopefully) hooks it all together.
- The movement of powerful workstations off engineers' tables and into the mainstream of computer-aided software engineering, financial trading and other applications. "The world is moving to workstations connected to servers," says Stewart Schuster, marketing vice-president of Sybase.

Sybase is a telling example of a rapidly emerging company that has cashed in on many of these trends. Its data base runs on DEC's VMS and Sun Microsystems' Unix machines, with development reportedly under way for the Apple Macintosh. In an interesting matchup, Apple's venture capital unit recently bought a stake in Sybase.

> IN THE data base field, the distinctions between what runs on IBM mainframes, DEC minis, Sun workstations or Apple micros are blurring.

In the data base field, the distinctions between what runs on IBM mainframes, DEC minis, Sun workstations or Apple micros are blurring. "The days of homogeneous hardware environments are behind us," says Oracle marketing head Jeff Walker.

Take a look at some recent industry hirings. Ashton-Tate is trumpeting its recruited talent from traditional mainframe data base vendors: Mike Benson from Cincom and Arvola Chan from Computer Corporation of America. Back at Cullinet, among those spearheading the highly touted IDMS/SQL project is Jon Nakerud, formerly of Relational Technology, which developed mid-range stalwart Ingres.

Data base software, like politics, is clearly making strange bedfellows. A regional Bell holding company (Ameritech) has already joined the party by snapping up ADR; micro software enfant terrible Philippe Kahn, the new owner of Ansa Software, is certain to cause a stir.

Meanwhile, all those ex-IBMers at Cullinet are courting DEC for a vaguely defined joint development deal. And on and on and on.

The technology is moving fast, and the stakes are high. Venture capital is flowing, and both the entrepreneurs and intrapreneurs are racing against the competitive clock. Users should be especially wary of marketing hype and should watch the players carefully. The data base marketplace is only going to get more confusing — and more exciting.

Wilder is *Computerworld's* senior editor, computer industry.

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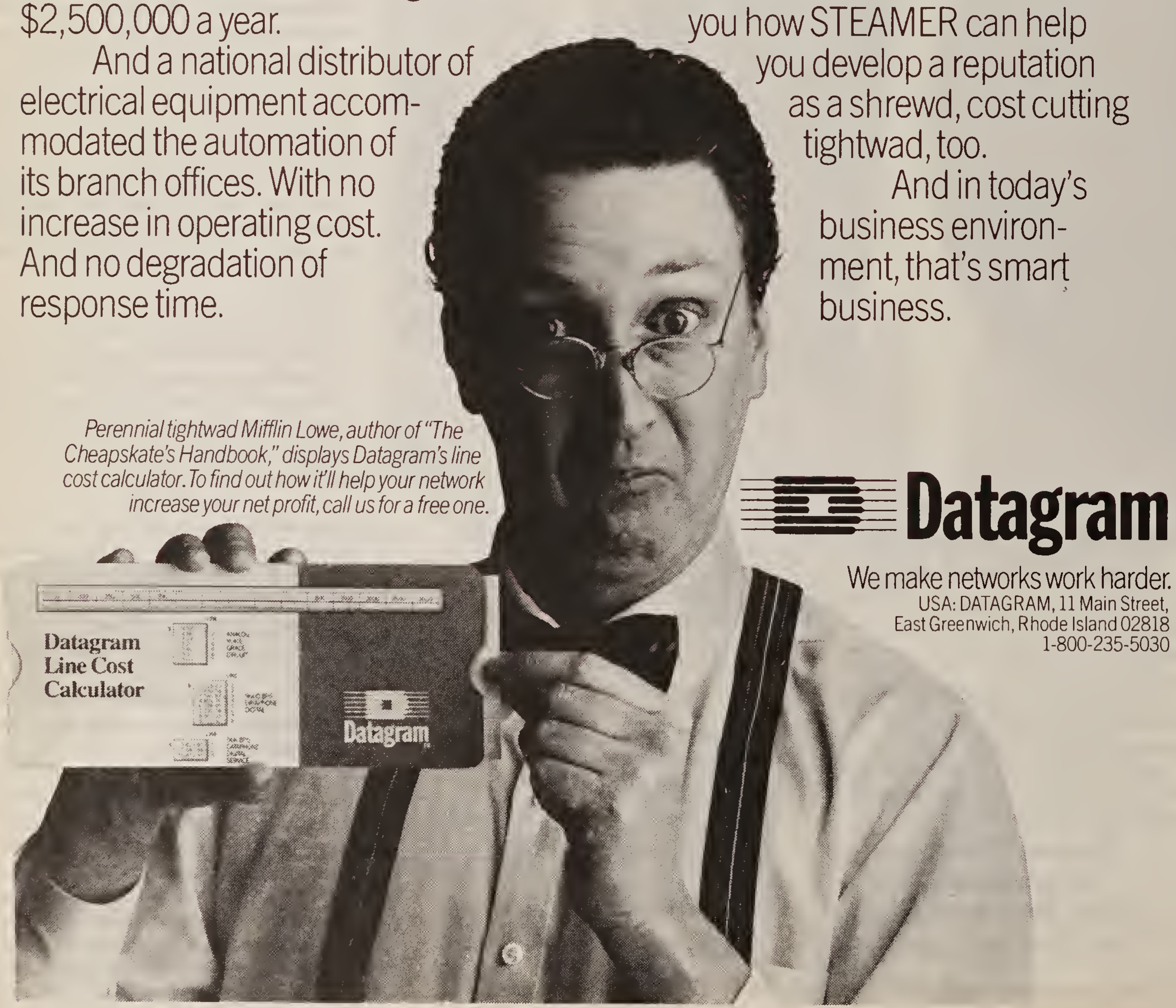

Perennial tightwad Mifflin Lowe, author of "The Cheapskate's Handbook," displays Datagram's line cost calculator. To find out how it'll help your network increase your net profit, call us for a free one.

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COMPUTERWORLD

SPOTLIGHT

PERSONAL COMPUTERS AND WORKSTATIONS

The introduction of the PS/2 created quite a stir in this year's micro market. Round three of the Hardware Roundup looks at that as well as other industry developments.

A Lot Of Promises.

A Lot Of Performance.

PC MAGAZINE
EDITOR'S CHOICE

Take a close look at these two machines. At 10 MHz, operating at one wait state, you might believe IBM's® Personal System/2™ Model 50 is one of the fastest 80286 computers available. Fact is, an InfoWorld benchmark test ranks the AST Premium/286's™ CPU performance number one.

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CPU measures main processor performance relative to the 6-MHz (Model 099) IBM PC AT. Hard disk performance is tested for sequential and random data access.

SYSTEM (80286-BASED PCS) (Clock speed in MHz/No. of wait states)	**CPU**	**Hard Disk** (sequential)	**Hard Disk** (random)
AST Premium/286 (10/0)	***2.25***	***1.41***	***2.12***
IBM PC AT (6/1)	1.00	1.00	1.00
IBM PC XT-™286 (6/0)	1.32	1.33	1.03
IBM PC AT (8/1)	1.37	1.17	1.40
IBM PS/2 Model 50 (10/1)	1.71	1.70*	1.19*
IBM PS/2 Model 60 (10/1)	1.72	2.02	1.67

*With RAM cache: seq. 1.92, ran. 1.03
Source: InfoWorld Hardware Benchmark System, as published in InfoWorld May 11, 1987

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Might the Personal System/2 become the New Coke of microcomputers? What does IBM's new formula have to offer?

PS/2 JOSTLES PC STANDARDS

BY ED SCANNELL

Major developments at a glance

The year in personal computers since the last Hardware Roundup

- ▶ **November 1986:** Zenith introduced its 80386-based PC, the Z-386 Models 40 and 80.
- ▶ **February:** Compaq Portable III is announced. The company also stopped production of the Portable Plus and two Portable 286 models.
- ▶ **March:** Apple introduced the Macintosh SE and Macintosh II.
- ▶ **April:** IBM introduced Personal System/2 and discontinued nearly all Personal Computer XT and AT models. The company, along with Microsoft, also announced OS/2, to be available next year.
- ▶ **July:** IBM shipped PS/2 Model 80.
- ▶ **August:** Tandy released 386-based Tandy 4000 and upgraded Tandy 3000. Lotus/Intel/Microsoft Expanded Memory Specification Version 4.0 debuts, allowing access to up to 32M bytes of extended memory. IBM filled out low end of PS/2 line with the Model 25, aimed primarily at education and casual-user markets as well as corporate networked environments.

CW CHART

Like the monolith in "2001: A Space Odyssey," IBM's Personal System/2 is a black box that has triggered more questions than it has answered since its April introduction. And the true mysteries of this masked machine will not be unlocked for at least 18 months — or until IBM and Microsoft Corp. deliver the OS/2 operating system and graphical interface for the product and leading developers release compatible applications.

What the PS/2 clearly has done so far is to move forward the technological standard set by IBM's Personal Computer series by incorporating more powerful processors, better graphics and larger storage capacities. However, the system's controversial Micro Channel bus, which contains IBM's proprietary secrets, is not completely compatible with the existing PC standard, and IBM has made clear that it is not going to make that system's specifications public.

Thus, the biggest question facing today's micro market is, how will IBM's new strategy affect the rest of the PC industry?

The year of the customer?

The immediate response of PC compatible makers to the PS/2 series was that its technical advances did not offer users any more than what their IBM PC AT-class machines could already provide. And competitors such as Compaq Computer Corp. claim IBM did not act responsibly toward its existing customer base. Some compare the PS/2's introduction with The Coca-Cola Co.'s unfortunate decision to market New Coke.

"When Coke tried to change its formula, it was inconceivable that it could be making such a mistake," said Rod Canion, Compaq's president and chief executive officer, after IBM's announcement. "I'm wondering if IBM didn't introduce the computer industry's version of New Coke when it tried to change its formula for its PCs."

Analysts contend that IBM is realigning its PC standard in part to shore up its steadily declining market share. According to a study released by International Data Corp. (IDC), a Framingham, Mass.-based market research firm, IBM's market share in 1986 dropped to 41.6% from 57.6% in 1985. Most of those market share percentage points were taken away by Tandy Corp., Leading Edge Hardware Products, Inc. and PC's Limited, all of which released systems that matched IBM's PC, PC XT and AT in features but were priced much lower.

Observers also say the Micro Channel makes it more difficult for PC compatible makers to access IBM mainframes, a market in which IBM makes approximately 75% of its rather substantial profits.

Minor immediate effects

Whatever long-term influence the PS/2 and its Micro Channel bus architecture have on compatible makers' sales and technical designs (see story page S7), the short-term effects have been minimal. Compaq, Tandy and PC's Limited, for instance, have all reported record quarterly revenues since the PS/2's introduction. Compaq will reportedly come close to $900 billion in U.S.

Scannell is *Computerworld*'s senior editor, microcomputers.

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PS/2 jostles

FROM PAGE 1

sales this year, and — joining both Apple Computer, Inc. and Hewlett-Packard Co. — is expected to surpass $1 billion in worldwide sales for this year, according to IDC.

In fact, business for the handful of leading compatible makers as well as for Apple was good both before and after the PS/2 series introduction. These companies all introduced major product lines ranging from Intel Corp. 8088- to 80386-based systems. In addition, they reduced prices on equipment, for the most part only when they brought out more powerful replacements.

WHEN COMPAQ introduced its Deskpro 386 late last year, the company broke with its tradition of waiting for IBM to set a standard before introducing a compatible product.

When Compaq introduced its Deskpro 386 late last year, the company broke with its tradition of waiting for IBM to set a standard before introducing a compatible product.

All the right moves

The move paid off handsomely, as Compaq has sold more than 60,000 units of the 386-based machine, giving it a healthy head start in that market and paving the way for the raft of 386-machines that soon followed. IBM only began shipping its 386-based system, the PS/2 Model 80, in early July.

In February, Compaq rolled out its Portable III along with a 12-MHz version of its Deskpro 286. Both systems sold well and were largely responsible for the company's 47% rise in first-quarter earnings this year. With the introductions, the company discontinued production of its Portable Plus and two models of its Portable 286.

On Aug. 3, which also marked the 10th anniversary of the release of its first PC, Tandy announced a slew of systems, including its first 386-based system, the Tandy 4000.

The company also upgraded its Intel 80286-based Tandy 3000 by introducing a 12-MHz version. It also rolled out a laptop system that features a backlit, supertwist LCD and a removable, rechargeable battery pack.

With these systems, Tandy is expected to go after corporate users more vigorously than in the past. The company reportedly is putting together a corporate

---

Charting workstation, PC territories

The *Computerworld* 1987 Hardware Roundup concludes this week with coverage of personal computers and 32-bit technical workstations.

This industry overview includes analyses and charts that take a look at the major vendors and their products in this specific arena of the industry. The charts list primary PCs and workstations and outline important buying criteria for each.

Where possible, definitions from market research firm International Data Corp. (IDC) were used to classify the products included.

PCs are generally defined by IDC as systems that have no more than four users and that are used primarily in business settings.

Machines in this category are general-purpose in nature, microprocessor-based, can be programmed in a high-level language and can attach a variety of peripheral devices to suit the user's needs.

For the most part, therefore, traditional home computers are not included in this classification in order to limit what is quite a large number of PC offerings.

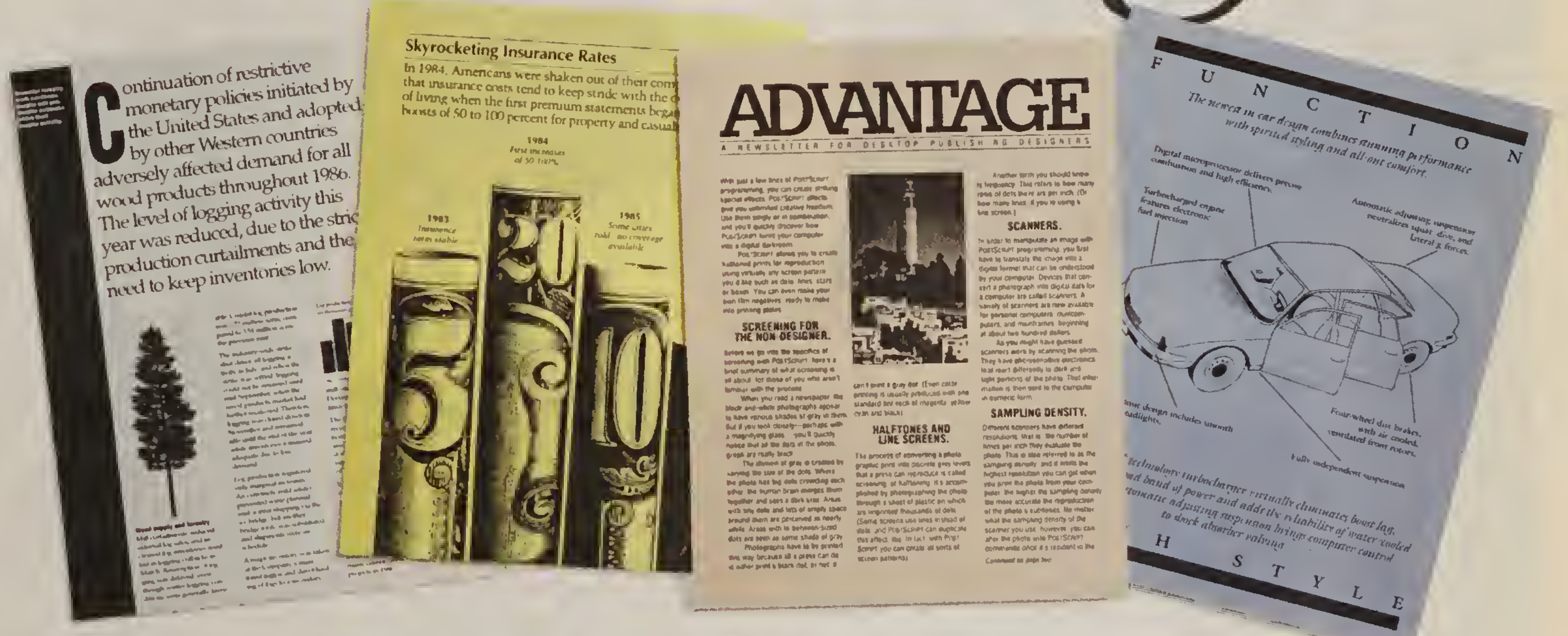
Chart compilation

CW has tried to be as comprehensive as possible in gathering the information presented. Thus, to compile the charts, questionnaires were mailed directly to vendors of products fitting this category.

In cases where no response was received or incomplete information was provided, CW estimated the answers, if it was possible to do so, using the most recent vendor literature or press information.

In the charts, "NA" can mean either that the information was not applicable to the product or that the information was not available from the questionnaire or from vendor literature.

The Magic.



Continuation of restrictive monetary policies initiated by the United States and adopted by other Western countries adversely affected demand for all wood products throughout 1986. The level of logging activity this year was reduced, due to the stric production curtailments and the need to keep inventories low.

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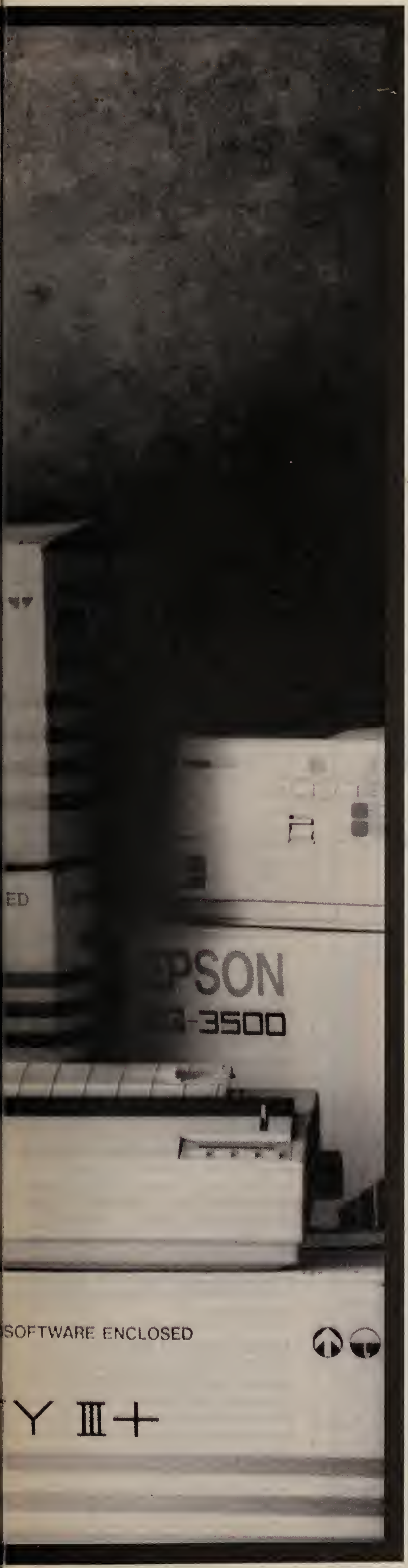

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service and support program to attract volume buyers.

The leading compatible makers say their sales will continue to grow, based on their systems' abilities to accept the industry-standard boards, run the OS/2 operating system and be upgraded with enhanced chip sets, such as the one that was recently announced by Chips and Technologies, Inc.

In addition, IBM's decision to discontinue production of its industry-standard PC XT and AT won't exactly hurt the compatible vendors' sales, either.

Running better

As these companies painstakingly pointed out several times this past year, OS/2 will not only run on their systems but, in some cases, would run better than on the PS/2 series. In July, Compaq introduced its Support Kit, which it says enables developers using the company's 286- and 386-based systems to develop applications to run under OS/2.

"The truth is that optimized PC performance under OS/2 has little or nothing to do with the new [PS/2] bus," Compaq's Canion said earlier this year.

In addition, chip sets will make the AT class of machines competitive for the rest of the decade, according to some observers.

These chip sets include the New Enhanced AT set, introduced in August by Chips and Technologies. The product, which has at its heart Advanced Micro Devices, Inc.'s 16-MHz 80286-16, boosts the speed and performance of 286-based machines to just less than that of 386-based machines and also makes them much more competitive with the 10-MHz PS/2 series. The product is compatible with both Microsoft's MS-DOS and OS/2.

> "MACINTOSHES AREN'T being used in the typical DP environments in large companies, but they are being used in specialized departments."
>
> TIM BAJARIN
> CREATIVE STRATEGIES RESEARCH INTERNATIONAL, INC.

Yet another product that will contribute to the longevity of AT-compatible machines is Version 4.0 of the Lotus/Intel/Microsoft Expanded Memory Specification, announced in August. The specification allows users to access up to 32M bytes of expanded memory and allows applications to use shared data in expanded memory.

Macintosh and the niche market

In the noncompatible arena, Apple's Macintosh continued to gain market share in large corporations in the past year. And even though only a few companies — such as Peat, Marwick, Main & Co. and Arthur Andersen & Co. — actually standardized around the Mac, many have scattered the machines throughout their companies as niche products.

"Macintoshes aren't being used in the typical data processing environments in large companies, but they are being used in specialized departments. Boeing, for example, has 1,500 Macs in engineering," says Tim Bajarin, an analyst with Creative Strategies Research International, Inc. in San Jose, Calif.

Apple's greatest opportunity for getting into both the commercial and engineering departments of corporations may be through bridge products that connect Macintoshes with Digital Equipment Corp.'s VAX minicomputers. This past summer, a number of third-party companies announced products that tie the two systems together.

"There is a lot of development going on with third parties tying the Mac to the VAX," says Clare Fleig, director of systems research for International Technology Group in Los Altos, Calif.

"This will prove significant in bringing Apple and DEC into the engineering and office segments," she adds.

Another significant factor that enhances Apple's chances in the corporate market is Hypercard, a $49 package the company announced in August.

Hypercard is a data base/programming tool kit that allows users to integrate text, graphics and video. Most analysts say it is a breakthrough package that will sell a lot of hardware to corporate accounts.

"The biggest demand among users in our research is not spreadsheets but the easy and flexible retrieval of information, and this product does just that," says Mike Orsak, an analyst with Robertson, Coleman & Stephens in San Francisco. "It really will be a software product that sells hardware."

Apple's chunk of the pie

With OS/2 and its graphical interface not expected until next year, Apple, many observers say, has a golden opportunity to gain an even larger slice of corporate market share with Multifinder, its multitasking operating system, which was announced in August, and a familiar graphical interface. However, some analysts say the company must improve its distribution strategies to better reach the corporate accounts.

"I think their chances are damn good, especially if IBM doesn't move quickly in delivering OS/2," says Marty Gruhn, an

Continued on page S9

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IBM's Micro Channel bus: Who's going to drive it?

Speculation runs high as to the reasons behind IBM's implementation of the Micro Channel bus, especially as it relates to IBM Personal Computer compatible makers and IBM's market share in the PC arena in general.

Does IBM have a valid technical purpose for redirecting its PC standard with the proprietary bus architecture in the Personal System/2 machines? Or is the company trying to put PC compatible makers out of business?

Of course, IBM says the new architecture is not intended to make life more difficult for its competitors but is simply a method of making the company's PC systems smaller, more reliable and more efficient for its users. According to the corporation, the design creates a more balanced system that better accommodates faster peripherals.

"It doesn't make a lot of sense to take a 400-horsepower engine and put it on bicycle tires with a 10-gallon tank," says Ed Kfoury, vice-president of research and development for IBM's Entry Systems Division.

"People put too much emphasis on the speed of the engine and not on the overall balance of the system," he claims.

> "IT doesn't make a lot of sense to take a 400-horsepower engine and put it on bicycle tires with a 10-gallon tank."
>
> ED KFOURY
> IBM ENTRY SYSTEMS DIVISION

Not surprisingly, others disagree.

Neil Colvin, chief executive officer and chief scientist at Phoenix Technologies Ltd. — a company that makes ROM BIOS products and sells them to PC compatible makers — doesn't say the Micro Channel architecture represents any great technological leap forward. But he does admit that its ability to handle multiple processors and its burst-mode direct-memory access are interesting.

"The burst-mode direct-memory access is important because it gives you high-speed, nonbuffered mass-storage devices, and the multimasters should be able to support a couple of coprocessors," Colvin says.

However, he adds, "That's nice, but why do we need it?"

To clone or not to clone?

In the first few weeks after the PS/2's introduction, Compaq Computer Corp. and other leading PC compatible makers said they would clone the Micro Channel only if there was sufficient demand in their customer base.

In recent months, however, these companies have been leaning toward offering systems that house standard PS/2 features like 3½-in. disk drives and IBM Video Graphics Array (VGA) capabilities without the Micro Channel.

"Most of the features in PS/2 machines are doable on AT-class machines, such as VGA and disk caching," says Andy Czernek, vice-president of products for Zenith Data Systems, referring to IBM's Personal Computer AT. "We will see several years of split market shares among XT, AT and Micro Channel architecture buses."

"We are trying to make people understand that it isn't an either/or strategy with the Micro Channel. It is only one of several ways of doing a bus architecture," says Bob Beech, a Compaq spokesman. "We try to make them understand that the bus in any personal computer is a passive part of that computer."

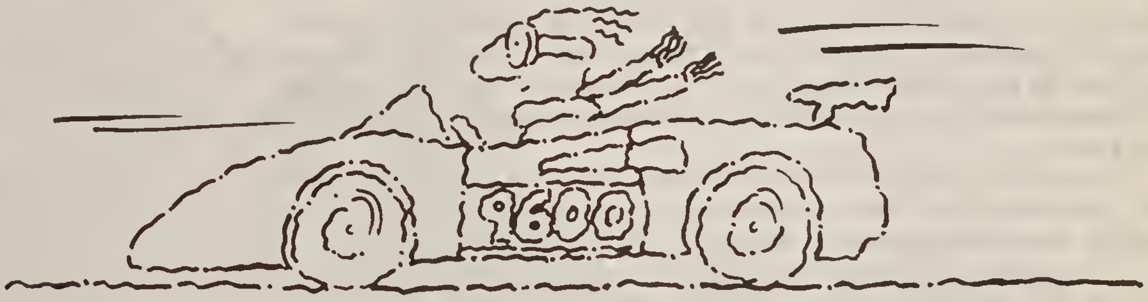
Compaq's architectural approach, beginning with its Deskpro 386, is to use a 32-bit memory bus — which "is where 90% of your action takes place," according to Beech — along with an 8-bit I/O bus to accommodate PC-compatible boards and peripherals.

"This way, we can off-load the bottleneck problem with the 8-MHz bus throughout the system. IBM [with the Micro Channel] has just chosen a different way," he says.

PC compatible makers interested in creating an architecture that functions like the Micro Channel — and there are not many that admit they are — will do so with no direct help from IBM: IBM says it will not make the system specifications public as it did with the PC. However, the company says it will license utility patents to interested parties as long as it does not infringe on any other IBM patent. The company has approximately 10,000 utility patents.

A utility license gives developers a way to emulate some of the features of the Micro Channel and saves them expensive and valuable development time. However, given the kind of royalties IBM demands from such licenses, observers say the company will not get many takers in the next year.

ED SCANNELL



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THE ANALYST WHO KNEW TOO MUCH.

Anderson & Lembke

What drove this man to build a spreadsheet 1,000 lines deep?

Recently, a financial software ad appeared in the Wall Street Journal under the headline: "When I told my friends about this ad they said, don't do it, Bob." It featured C. Robert Tully, for 15 years a vice president and chief financial officer of the $3 billion Celanese Corporation, and it caused quite a stir.

We can still send you a copy of that ad if you missed it. (Just give us a call.) But today we'd like to share with you the story of a Fortune 500 company that uses the product Mr. Tully risked his reputation over.

It is a story well worth reading. It will help you answer questions your CFO will probably ask you. It could help you save your company money. And it could help you rescue your company–like the MIS executive below did for his–from "the analyst who knew too much."

You will also learn about a new advanced financial software product called FASTAR, which was developed by Corporate Class Software, a subsidiary founded by the $3 billion Celanese Corporation.

Here's what happened.

The vice president of finance for a $2 billion-plus manufacturing company was worried. He had learned one of his analysts had created a monster spreadsheet 1,000 lines deep, and growing deeper by the day.

Could that be the reason for the slow analysis in his department, he wondered? Every request seemed to stall. An ad hoc request for year-to-year cost comparisons took a full day. A day! By then decisions had already been made and other problems needed attention.

What would happen if the company added a new division, he asked? Or assigned more product lines to an analyst? How much time would be lost?

TROUBLE, TROUBLE, TROUBLE.

A call to MIS was sent out for help.

The MIS chief had been around long enough to know that the monster spreadsheet was just the tip of the iceberg.

Like most companies, financial data was spread out among the divisions of the corporation. And different departments used different formats to store the data.

As a result, analysts had a difficult time accessing needed data quickly.

To make matters worse, financial analysts had created their own data empires on PCs, and many had built elaborate and shaky programs with macros. (Though none so huge as the 1,000-line monster. "It was hideous," said one programmer who saw it.)

What would you have done in the MIS executive's position?

As one observer put it: "They saw that they were heading down a funnel."

A DRAMATIC DISCOVERY.

The way out came from a company called Corporate Class Software.

This company had developed a product known as FASTAR–Financial Application Solution to Analysis and Reporting–that was the first *packaged* solution to *advanced* financial applications.

No fourth generation languages were needed to perform advanced financial applications. No macros were necessary. And all data from FASTAR could be loaded onto Lotus 1-2-3 spreadsheets for work there. (Yes, we'd be skeptical too. You'll find out how all this was done in a minute.)

When the decision was made to test FASTAR, the same ad hoc cost comparison that once took a day, now took minutes. Minutes!

What's more, the company now had the flexibility to assign new divisions and product lines to analysts without taking time to reprogram the system. FASTAR is built to expand horizontally (for companies) and vertically (for products). In virtually unlimited numbers. The MIS executive was so impressed with FASTAR, in fact, that he now uses it to manage and analyze information from the more than 10 cost centers in his own department.

How could all this be done?

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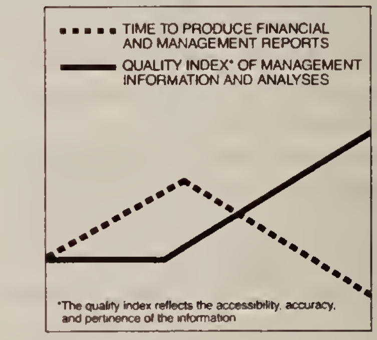

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PS/2 jostles

CONTINUED FROM PAGE S6

analyst with The Sierra Group, located in Tempe, Ariz. "But they have to get the right distribution. Their national accounts program has been a yo-yo. It's been up and down. They can't decide on which way to go."

In addition, Gruhn says, DEC's local-area Vaxcluster, announced early this year, serves as a decided threat to the PS/2-OS/2 combination because of the multitasking opportunities it presents to users.

"The way it is constructed, you don't need a multitasking operating system because users can sit at their workstations and send out jobs to multiple Microvaxes on the network," Gruhn says, referring to another DEC product. "I think it will be a major competitor to the PS/2s."

Laptop sales sluggish

While a few vendors did well in the laptop market in the past year, most notably Zenith Electronics Corp.'s subsidiary, Zenith Data Systems — which maintained a 35% share — the market continued to show slow growth throughout the last 12 months.

> "THE pivotal thing that happened in the PC marketplace in 1987 is that IBM took a stand-alone product and turned it into a workstation."
>
> CLARE FLEIG
> INTERNATIONAL TECHNOLOGY GROUP, INC.

The most notable market failure, perhaps, was IBM's Convertible system, which recorded unimpressive sales, according to most market researchers, and was being discounted heavily by dealers and resellers.

What will stimulate greater demand for laptop systems will be improved displays and more powerful processors, such as the 286 and 386, according to Zenith's Vice-President of Products Andy Czernek.

Analysts note that only Zenith and Tandy have laptops that use backlit supertwist LCDs, which greatly improve screen contrast.

"When you take an LCD screen and put up 80-by-25 [characters], you need perfect lighting before you can read it," says Ed Juge, Tandy's director of corporate communications. "But I think our [Model 1400] offers the same sort of contrast as a video screen."

Workstation/PC lines blurring

In other personal computer-related news, this year's 32-bit technical/engineering workstation market saw the major players in the field — DEC, Apollo Computer, Inc. and Sun Microsystems, Inc. — leapfrogging over each other with price/performance claims as they took turns slashing prices on their existing lines and bringing out new ones.

The cost-cutting moves threatened to wipe out any significant price/performance distinctions between workstations and high-end microcomputers.

"There has been some blurring of the lines with PCs and workstations over the last year," says Robertson Coleman's Orsak.

"With all the price cuts, entry-level points [for workstations] are around $5,000, and that's what it can cost for a PC," Orsak explains.

Another factor contributing to the blurring of the line between workstations and PCs, according to some analysts, is the way IBM positioned its PS/2 line. One observer points out that IBM didn't call its new computers "systems" by accident.

"The pivotal thing that happened in the PC marketplace in 1987 is that IBM took a stand-alone product and turned it into a workstation," says International Technology Group's Fleig.

"I think that development will form the basis for what the compatible makers have to do," she adds.

Fleig and other analysts maintain that corporations must now consider how microcomputers and workstations can work with the raft of telecommunications and host systems that are within the corporation and not just view them as systems for individual productivity.

Apple contributed to the confusion in the workstation/PC arena as well, some observers say, by positioning its Macintosh II microcomputer as a workstation in both the commercial and scientific marketplaces.

Some analysts like the Mac's chances in this marketplace. "The Mac could be a spoiler for DEC's VAX workstation strategy," according to The Sierra Group's Gruhn.

While the workstation market experienced a noticeable encroachment by PCs in the past 12 months or so, the PC market saw some other interesting trends emerge in the area of hardware technology. For instance, facsimile boards for the PC proliferated, and Zenith made initial deliveries on its flat-technology monitor, which also increases the readability of video screens.

However, the past year will be mostly remembered for the black box that IBM dropped into the PC market.

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Special Report on PC software's "Big 3"

- **Big 3 ratings.** In-depth report cards give all three companies "A" to "F" ratings on five crucial areas: technology, product support, management, customer relations, and market strategy.
- **The challengers.** Can companies like Borland, WordPerfect, Computer Associates, IBM, and Claris unseat the top tier? If so, how—and what are their chances?
- **The incredible aftermarket.** A not-to-be-missed article discusses the hundreds of software developers who have created a huge Big 3 aftermarket of successful add-ons, add-ins, and applications programs.
- **PC software market overview.** Readers get a look at it all—successful products, market shares, revenue trends, promising new markets, and growth potential.

Computerworld SPOTLIGHT on the Macintosh market

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Hardware Roundup: Personal computers

COMPANY	PRODUCT	CPU	CLOCK SPEED (MHz)	OPERATING SYSTEM	INTERNAL MEMORY RANGE (MBYTES)	DISK STORAGE RANGE (MBYTES)	NUMBER OF EXPANSION SLOTS	NUMBER OF I/O PORTS	DESKTOP OR PORTABLE	STANDARD PRICE
Altos Computer Systems **(800) ALTOS-US**	Altos 686	80286	7.5	Xenix 3.0	1-2	25-50	2	6	Desktop	$4,995
	Altos 886	80286	7.5	Xenix 3.0	1-2	50-80	2	8	Desktop	$9,195
	Altos 386 Series 2000	80386	16	Xenix 5.2	4-16	80-510	2 or 3	Up to 64	NA	$22,000
Apple Computer, Inc. **(408) 996-1010**	Macintosh 512K Enhanced	68000	7.83	Proprietary	512K	400K-800K*	NA	2	Desktop	$1,699
	Macintosh Plus	68000	7.83	Proprietary	1-4	800K*	NA	2	Desktop	$2,199
	Macintosh SE	68000	7.83	Proprietary	1-4	800K-20M*	NA	7	Desktop	$2,898
	Macintosh II	68020	15.7	Proprietary	1-8	800K*	6	6	Desktop	$3,769
AT&T **Contact local sales office**	PC 6300	8086	6	MS-DOS, PC-DOS	256K-640K	Up to 20*	NA	NA	Desktop	$1,485
	PC 6300 Plus	80286	6	Unix System V, MS-DOS 3.1	512K-7M	Up to 20*	NA	NA	Desktop	$1,740
	PC 6310	80286	6	MS-DOS 3.2, Xenix	1-7	20-68	NA	NA	Desktop	$3,800
Compaq Computer Corp. **(713) 374-1564**	Deskpro Model 2	8086	7.14	MS-DOS	256K-640K	720K	7	1	Desktop	$1,699
	Deskpro 286 Model 1	80286	12	MS-DOS	256K	1.2	7	3	Desktop	$2,999
	Deskpro 286 Model 20	80286	12	MS-DOS	256K	1.2-2	7	3	Desktop	$3,999
	Deskpro 386 Model 40	80386	16	MS-DOS	1-10	1.2-40	6	3	Desktop	$6,499
	Deskpro 386 Model 70	80386	16	MS-DOS	130K	1.2	5	3	Desktop	$7,299
	Compaq Portable	8088	4.77	MS-DOS	256K-640K	720K	3	4	Portable	$2,199
	Compaq Portable II	80286	8	MS-DOS	720K	2	NA	4	Portable	$2,999
	Compaq Portable III	80286	12	MS-DOS	640K-6.6M	1.2	NA	4	Portable	$3,999
Compupro **(415) 786-0909**	Compupro MP4	V20	8	Concurrent DOS	1	40-160	NA	4	Desktop	$6,995
	Compupro 286/80	80286	10	Concurrent DOS	768K-1M	80	16	9-18	Desktop	$12,500
	Compupro MP14	80286	12.5	Concurrent DOS	1-6.5	80	16	18	Desktop	$18,995
Cordata, Inc. **(800) 621-6746** **(800) 331-5867 (Calif.)**	ATD Desktop	80286	8	MS-DOS 3.1	640K	20-40	6	2	Desktop	$2,295
Data General Corp. **(800) 343-8842**	DG/One Model 2T	8088-2	7.16	MS-DOS 3.2	512K-2.5M	720K-10M	2	2	Portable	$1,695
	Dasher-286	80286	10	MS-DOS	640K	20 or 40	6	3	Desktop	$2,295
Digital Equipment Corp. **Contact local sales office**	Vaxmate	80286	8	MS-DOS 3.1	1-3	20	2	3	Desktop	$4,045
Epson America, Inc. **(213) 539-9140**	Epson Equity I + PC	8088-10	4.77 or 10	MS-DOS; GW Basic	640K	360K-10M	5	2	Desktop	$1,095
	Epson Equity II	V30	4.77 or 7.16	MS-DOS; GW Basic	640K	360K-20M	5	2	Desktop	$1,295
	Epson Equity III + PC	80286	6, 8 or 10	MS-DOS; GW Basic	640K-15.5M	360K-40M	9	2	Desktop	$2,695
Grid Systems Corp. **(800) 222-GRID**	Gridlite	8086	4.77	MS-DOS 3.2	128K-640K	720K	NA	5	Portable	$1,750
	Gridcase-Plus	8086	4.77	MS-DOS 3.2	128K-640K	10 or 20	NA	7	Portable	$2,750
Hewlett-Packard Co. **(800) 367-4662**	Touchscreen II	8088	8	MS-DOS 3.2	256K	40*	4	4	Desktop	$2,480
	Vectra PC	80286	8	MS-DOS	640K	40*	8	8	Desktop	$2,995
Hyundai Electronics America **(408) 986-9800**	Super 286C	80286	8 or 10	MS-DOS 3.2; GW Basic	640K-1M	20, 40	6	3	Desktop	$1,499
IBM **Contact local sales office**	Personal Computer AT Model 339	80286	8	PC-DOS, Xenix	512K-15.5M	1.2-30*	8	8	Desktop	$4,595
	Personal System/2 Model 25	8086	8	PC-DOS 3.3	512K	720K-1.44M*	2	3	Desktop	$1,350
	PS/2 Model 30	8086	8	PC-DOS 3.3	640K	720K-20M*	3	NA	Desktop	$1,695-$2,295
	PS/2 Model 50	80286	10	PC-DOS 3.3, OS/2	1-7	1.44-20*	3	NA	Desktop	$3,595
	PS/2 Model 60	80286	10	PC-DOS 3.3, OS/2	1-15	1.44-70*	7	NA	Desktop	$5,295-$6,295
	PS/2 Model 80	80386	16 or 20	PC-DOS 3.3, OS/2	1-16	44-628*	7	NA	Desktop	$6,495-$13,995
ITT Xtra Business Systems **(408) 945-8950**	Xtra/Professional Series 300	8088	4.77 or 10	MS-DOS 3.2	128K-768K	720K-20M	4	3	Desktop	$1,299
	Xtra/Professional Series 400	80286	6 or 10	MS-DOS 3.2	1-16	1.44-72	8	2	Desktop	$3,199
	Xtra/Professional Series 700	80386	16	MS-DOS 3.2	1-16	1.44*	9	2	Desktop	$6,499
	Xtra/286 XL	80286	8	Xenix System V	1.6-4	40-72	9	3	Desktop	$9,899-$13,999
	Xtra/386 XL	80386	16	Xenix System V	2-16	40-160	9	3	Desktop	$14,799-$42,499
Kaypro Corp. **(800) 4-KAYPRO**	2000+	V20	6-16	MS-DOS 3.2	768K	1.4	NA	2	Portable	$1,995
	286I Model A	80286	10	MS-DOS 3.2	640K	1.2	7	2	Desktop	$1,995
	386 Model E	80386	6-16	MS-DOS 3.2	2.5	1.2	6	2	Desktop	$4,495

**Computerworld* estimates based on vendor-supplied information.

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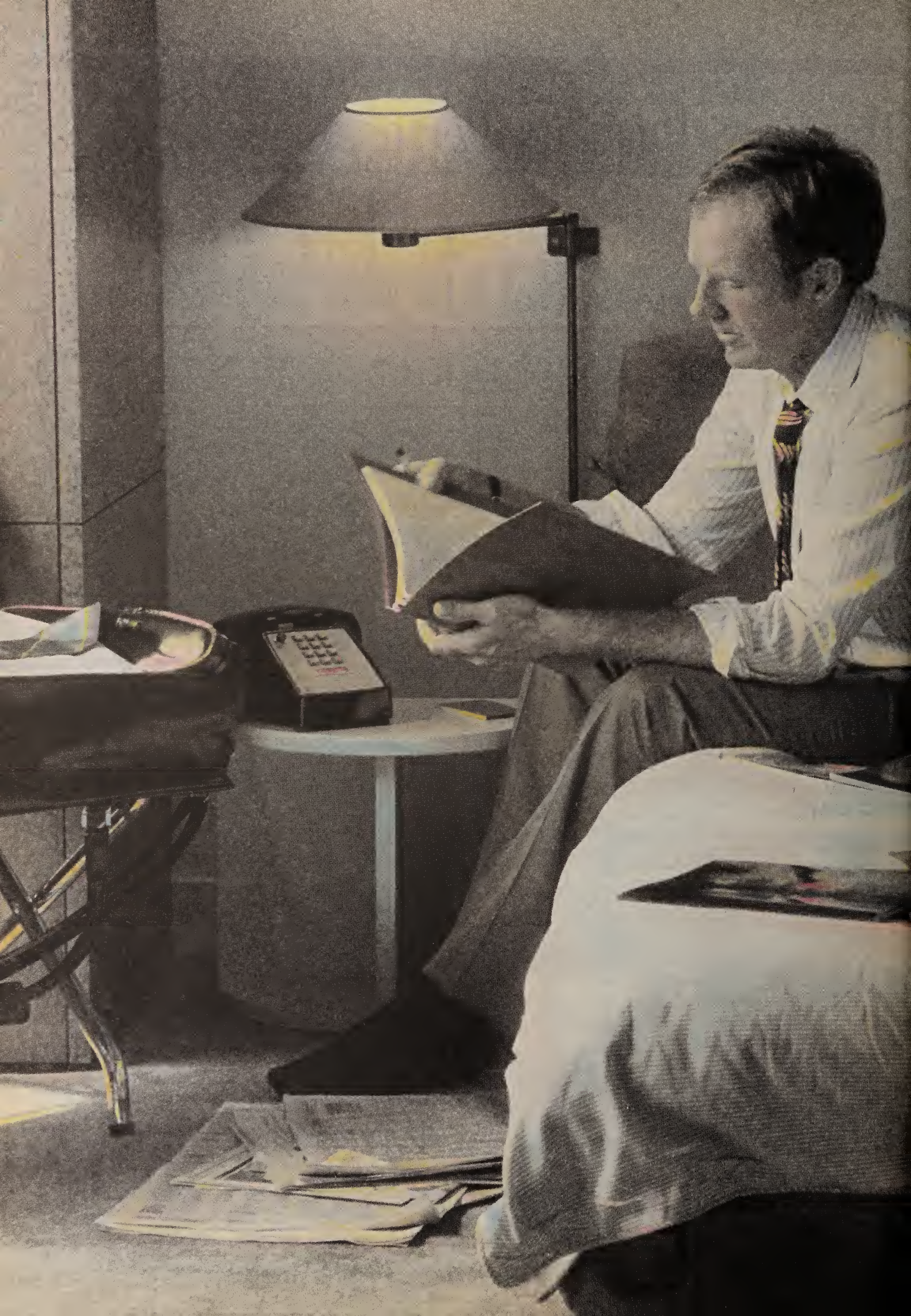

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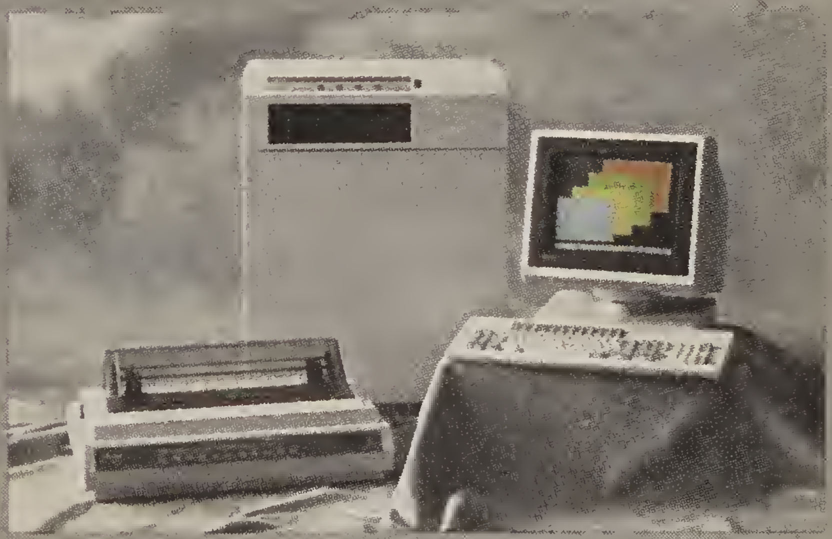

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- ☑ **PS/2 and OS/2:** Their current state (and problems) have been well documented, but what will they grow into—and has IBM truly responded to customer needs with this combination?
- ☑ **IBM's newly created Applications Systems Division,** which seeks to (among other goals) aid non-IBM software vendors as they develop applications. How far along is it, and what is the expected effect on the market?
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COMPANY	PRODUCT	CPU	CLOCK SPEED (MHz)	OPERATING SYSTEM	INTERNAL MEMORY RANGE (MBYTES)	DISK STORAGE RANGE (MBYTES)	NUMBER OF EXPANSION SLOTS	NUMBER OF I/O PORTS	DESKTOP OR PORTABLE	STANDARD PRICE
Leading Edge Hardware Products, Inc. **(800) USA-LEAD** **(617) 828-8150 (Mass.)**	Model D	8088-2	4.77 or 7.16	MS-DOS 3.1	512K-768K	720K	4	2	Desktop	$1,095
	Model D2	80286	6-10	MS-DOS 3.2	640K-1M	160K-1.2M	6	2	Desktop	$1,936
MAI Basic Four, Inc. **(714) 731-5100**	DS-500	8088	4.77	MS-DOS	256K-640K	360K-20M	2	3	Desktop	$1,275
	DS-520	8088	4.77	MS-DOS	256K-640K	20	1	3	Desktop	$2,275
	MAI 1500	80286	8-10	MS-DOS, BOSS	640K	20-230	8	2	Desktop	$3,995
NCR Corp. **(800) CALL-NCR**	PC6 series	8088-2	4.77 or 8	Proprietary	256K-640K	Up to 40	8	2	Desktop	$2,680
	PC710	80286	6 or 10	Proprietary	640K	720K-1.44M*	4	2	Desktop	$1,954
	PC916	80386	4.77-16	Proprietary	2-4	1.2-1.44*	5	2	Desktop	$6,353
	PC810	80286	6 or 10	Proprietary	640K	360K-1.44M*	6	2	Desktop	$4,720
	PC916	80386	4.77-16	Proprietary	2-4	1.2-1.44*	5	2	Desktop	$6,353
NEC Information Systems, Inc. **(617) 264-8000**	APC IV Powermate 1	80286	8	MS-DOS 3.2	640K-8.6M	20-80	6	2	Desktop	$1,995
	APC IV Powermate 2	80286	8 or 10	MS-DOS 3.2	640K-10.5M	20-106	8	3	Desktop	$2,595
	APC IV Businessmate	80286	10	Xenix System V 2.2	640K-10.6M	40-106	8	11	NA	$4,995
	Powermate 386	80386	16	MS-DOS 3.2	1-16	20-260	8	3	Desktop	$5,495
PC's Limited **(800) 624-9897** **(512) 339-6964 (Texas)**	Turbo	8088-2	4.77 or 8	MS-DOS	640K	20-40	8	1	Desktop	$799
	286-8	80286	6-8	MS-DOS	1-16	20-40	8	4	Desktop	$1,799
	286-12	80286	6 or 12	MS-DOS	1-16	40-70	8	4	Desktop	$2,699
	386-16	80386	16	MS-DOS	1-16	40-150	8	4	Desktop	$4,499
Sharp Electronics Corp. **(800) 526-0264** **(201) 524-9500 (N.J.)**	PC-4501	V40	7.17	MS-DOS 2.11	256K-1.2M	720K	3	2	Portable	$1,295
	PC-4502	V40	7.17	MS-DOS 3.2	256K-1.6M	1.4	3	2	Portable	$1,695
	PC-7160	8086	7.37	MS-DOS 2.11	320K-704K	20	5	2	Portable	$2,995
	PC-7221	80286	10	MS-DOS 3.2	640K-1.2M	20	5	3	Portable	$3,995
Tandy Corp./Radio Shack **(817) 390-3011**	Tandy 1000 EX	8088	4.77 or 7.16	MS-DOS 2.11, GW Basic	256K-640K	360K	3	7	Desktop	$599
	Tandy 1000 SX	8088	4.77 or 7.16	MS-DOS 3.2, GW Basic	384K-640K	360K-20M	5	7	Desktop	$999
	Tandy 3000 HL	80286	4 or 8	MS-DOS 3.2, Basic	512K-1M	360K-40M	7	1	Desktop	$1,699
	Tandy 4000	80386	16	MS-DOS 3.3, OS/2, Unix System V.3	1-16	1.44	9	2	Desktop	$2,599
Televideo Systems, Inc. **(408) 745-7760**	Tele-386	80386	16	NA	2-16	40*	8	2	Desktop	$3,750
Toshiba America, Inc. Information Systems Division **(800) 457-7777**	T1000	8088	4.77	MS-DOS 2.11, MS-DOS 3.0	512K-1.2M	720K	0	7	Portable	$1,199
	T1100 Plus	8086	4.77 or 7.16	MS-DOS 3.2	640K	1.44	1	6	Portable	$2,099
	T1200	8086 (high-performance)	4.77 or 9.54	MS-DOS 3.2	1	720K-20M	1	7	Portable	$3,499
	T3100/20	80286	4 or 8	MS-DOS 3.2	640K-2.6M	720K-20M	1	6	Portable	$4,699
	T5100	80386	8 or 16	MS-DOS 3.2	2-4	1.44-40	1	6	Portable	$6,499
Unisys Corp. **(800) 547-8362**	PC/Micro IT	80286	6,7.16 or 8	MS-DOS 3.0, Xenix	512K-3M	20-60	5	2	Desktop	$3,315
	PC/IT	80286	6, 7.16 or 8	MS-DOS 3.0, Xenix	512K-5M	40-234	8	3	Desktop	$4,025
Wang Laboratories, Inc. **(800) 522-WANG**	Wang PC 240	80286	6, 8 or 10	MS-DOS 3.2	640K to 6M	1.2-41.2	4	2	Desktop	$2,125
	Wang PC 280	80286	6, 8 or 10	MS-DOS 3.2	640K-10.5M	1.2-137.2	8	1	Desktop	$3,850
	Wang PC 380	80386	8 or 16	MS-DOS 3.2	2.5-10.5	1.2-137.2	8	1	Desktop	$6,495
	Wang Professional Computer	8086	8	MS-DOS 3.2, Xenix System V, PC IN/IX	512K	360K-20M	5 or 8	2	Desktop	$1,940
	Wang Advanced Professional Computer	80286	10	MS-DOS 3.2, Xenix System V, PC IN/IX	512K-2M	360K-30M	5 or 8	2	Desktop	$3,265
	Wang Laptop Computer	V30	8	MS-DOS 3.2	512K-1M	360K-10M	2	1	Portable	$3,530
Wyse Technologies, Inc. **(800) GET-WYSE**	Wyse PC+	8088-1	4.77 or 9.54	MS-DOS 3.2	640K	20	2	3	Desktop	$1,199
	Wyse PC 286 Model 2108	80286	8	MS-DOS 3.2	512K	Up to 20	7	2	Desktop	$1,599
	Wyse PC 286 Model 2200	80286	8 or 10	MS-DOS 3.2	640K	40	8	2	Desktop	$1,999
	Wyse PC 286 Model 2112	80286	12.5	MS-DOS 3.2	1	Up to 40	8	2	Desktop	$2,299
	Wyse PC 386	80386	16	MS-DOS 3.2	1	40	9	3	Desktop	$3,799
Zenith Data Systems **(800) 842-9000**	Eazy PC	V40	7.16	MS-DOS 3.2	512K-640K	Up to 20	0	1	Desktop	$999
	Z-159	8088-2	4.77, 8	MS-DOS 3.2	1.6	Up to 20	4	2	Desktop	$1,599
	Z-181	8088-2	4.77, 8	MS-DOS 3.2	640K-1.6M	Up to 10	0	2	Portable	$2,399
	Z-183	8088-2	4.77, 8	MS-DOS 3.2	640K-1.6M	Up to 10	1	2	Portable	$3,499
	Z-286	80286	8	MS-DOS 3.2	512K-16M	20	4	2	Desktop	$2,399
	Z-248	80286	8	MS-DOS 3.2	512K-16M	Up to 40	6	2	Desktop	$3,699
	Z-386	80386	16	MS-DOS 3.2	1-16	Up to 80	5	2	Desktop	$6,499

Hardware Roundup: Workstations

COMPANY	PRODUCT	CPU	PERFORMANCE (MIPS)	DEDICATED FLOATING-POINT PROCESSOR	MAIN MEMORY RANGE (MBYTES)	STORAGE RANGE (MBYTES)	OPERATING SYSTEM	NETWORKS SUPPORTED	GRAPHICS RESOLUTION (PIXELS)	STANDARD PRICE
Adage, Inc. (617) 667-7070	6480-2	NA	1	68881	1-9	760	MicroVMS	Ethernet, Decnet	1,024 x 1,024 (color)	$21,000
	6800-2	NA	1	68881	1-9	760	MicroVMS	Ethernet, Decnet	1,024 x 1,024 (color)	$40,300
Apollo Computer, Inc. (617) 256-6600	DN3000	68020	1.5	68881	2-28	72-348	Domain IX, Aegis	Ethernet	1,280 x 1,024 (15-in.), 1,024 x 2,800 (19-in.)	$4,990
	DN4000	68020	4	68881	4-32	155-348	Domain IX, Aegis	Ethernet	1,280 x 1,024 (15-in.), 1,024 x 2,800 (19-in.)	$13,900
	DN580 Turbo	68020	3.5	68881	8-16	155-696	Domain IX, Aegis	Ethernet	1,280 x 1,084 (19-in.)	$49,900
	DN590 Turbo	68020	3.5	68881	8-16	155-696	Domain IX, Aegis	Ethernet	1,280 x 1,084 (19-in.)	$57,900
AT&T Contact local sales office	Unix PC Model 7300	68010	NA	NA	0.5	512K-2M	Unix System V	Starlan/Unix	NA	$3,495
	Unix PC Model 3B1	68010	NA	8086-2	512K-2M	NA	Unix System V	Starlan/Unix	NA	$5,745
Bettex, Inc. (603) 883-2355	Bettex 3100	NA	40	Yes	2-24	NA	NA	NA	NA	$50,000
California Computer Products, Inc. (800) CAL-COMP	Formula 1	68020	NA	DSP32	NA	1*	NA	NA	1,280 x 1,024 (color)	$9,495
	Vistagraphic 4500MV	68000	NA	NA	512K-2M*	NA	MicroVMS 4.1 or higher	NA	1,280 x 1,024	$29,375
	7500 series	NS32032	NA	NA	2-6	NA	Genix	Ethernet	1,280 x 960 (displayable)	$40,925
Control Data Corp. (800) 345-9903	Cyber 910-300	68020	2	Yes	4-16	182-364	Unix	TCP/IP[2], CDC proprietary LAN	1,024 x 7,680 (color)	$25,500-$60,600
	Cyber 910-500	RISC[1]-based	10	Yes	8-16	182-364	Unix	TCP/IP, CDC proprietary LAN	1,024 x 1,024 (color)	$72,400-$84,900
Data General Corp. Contact local sales office	DS/7500 series	Proprietary	1	Yes	4-10	70-320	AOS/VS, AOS/DVS, DG/UX	TCP/IP, NFS[3], Ethernet, X.25, Starlan, SNA[4], MAP[5]	1,024 x 800, 1,280 x 1,024 (mono, color)	$15,900-$25,900
Datapoint Corp. (512) 699-7000	Model 1670 Starlift with Starport file processor	V20, 80286	1.6	NA	512K-640K (Starport)	20-60 (Starport)	MS-DOS, NTNX	NA	NA	$5,440
Digital Equipment Corp. (617) 493-8717	Vaxstation 2000	NA	1	78084	2-6	Up to 318	VMS, Ultrix	Ethernet	1,024 x 864	$4,600
	Vaxstation 2-GPX	NA	1	78084	5-16	Up to 477	VMS, Ultrix	Ethernet	1,024 x 864	$19,900
	Vaxstation 2	NA	1	78084	3-16	Up to 477	VMS, Ultrix	Ethernet	NA	$26,000
Hewlett-Packard Co. Contact local sales office	HP 9000 Model 318	68020	2	68881	4	270K-571M	Unix, HP-UX	Ethernet	1,024 x 768 (mono)	$7,800
	HP 9000 Model 330	68020	2	68881	4-8	270K-571M	Unix, HP-UX, HP Basic	Ethernet	1,024 x 768; 512 x 400 (mono, color)	$12,500-$16,900
	HP 9000 Model 350	68020	4	68881	8-32	270K-571M	Unix, HP-UX	Ethernet	1,024 x 768 (mono, color)	$24,600-$54,900
	HP 9000 Model 8255RX	Proprietary	8.2	Yes	8-48	132-571	Unix, HP-UX	Ethernet	1,280 x 1,024 (color)	$69,500
IBM Contact local sales office	IBM Personal System/2 Model 80	80386	2.4-3.1	80387	1-16	44-628	PC-DOS 3.3, OS/2	PC Network, Token-Ring	640 x 480 x 16 (color), 320 x 200 x 256 (color), 720 x 400 x 16 (color)	$6,995-$13,995
	RT Personal Computer	Proprietary	4.2	68881	4-16	70M-5.6G	Unix System V with 4.2 extensions	TCP/IP, Token-Ring, PC Network	750 x 512; 1,024 x 1,024 (mono, color)	$10,600-$16,100
Intergraph Corp. (205) 772-2000	Interpro 32C	Clipper	5	Yes	6-16	1.2-80	Unix V.3	TCP/IP, XNS[6], Ethernet	1,184 x 884	$25,000
	Interpro 220	Clipper	5	Yes	8-16	156	Unix V.3	TCP/IP, XNS, Ethernet	1,184 x 884	$29,000
	Interpro 240	Clipper	5	Yes	8-16	156	Unix V.3	TCP/IP, XNS, Ethernet	1,184 x 884	$33,000
	Interact 32C	Clipper	5	Yes	6-16	1.2-80	Unix V.3	Ethernet	1,184 x 884	$40,000
Integrated Solutions, Inc. (408) 943-1902	408WS	68020	4	68882	4-24	106-640	Unix 4.3, Unix System V	Ethernet, TRFS, NFS	1,280 x 1,024 (mono)	$16,400
	416WS	68020	4	68882	4-56	106-640	Unix 4.3, Unix System V	Ethernet, TRFS, NFS	1,280 x 1,024	$17,900-$25,900
	424WS	68020	4	68882	4-56	106M-4G	Unix 4.3, Unix System V	Ethernet, TRFS, NFS	1,280 x 1,024	$21,900-29,900
Mentor Graphics Corp. (503) 626-7000	Compute Engine Accelerator	Proprietary	5-10	Yes	10-182	NA	Proprietary, Unix-like under Aegis	Domain, Ethernet	NA	$36,000
Motorola, Inc. (800) 556-1234, ext. 230 (800) 441-2345, ext. 230 (Calif.)	VME Delta series Model 2316	68020	1.8-2	68881	2-4	67-160	Unix System V/68 Release 3, Versados	TCP/IP, Ethernet, MAP, SNA, BSC[7], X.25	640 x 300	$10,145
	VME Delta series Model 2616	68020	2-3	68881	2-16	67M-2G	Unix System V/68 Release 3, Versados	TCP/IP, Ethernet, MAP, SNA	640 x 300	$18,995
	VME Delta series Model 2825	68020	4-5	68881	8-24	67M-2G	Unix System V/68 Release 3, Versados	TCP/IP, Ethernet, MAP, SNA	640 x 300	$28,995
NEC Information Systems, Inc. (800) 343-4419 (617) 264-8635 (Mass.)	NEC 1500 Advanced Workstation	68020	1.86	68881	4-32	4G	Unix System V.2.2	Ethernet, TCP/IP, NFS	1,280 x 1,024	$27,500
Prime Computer, Inc. (800) 343-2540 (800) 322-2450 (Mass.)	PXCL 5500 Workstation	MIPS R2000	5	Yes	4-12	170-340	Unix V.3	Ethernet, TCP/IP, NFS	1,280 x 1,024	$74,900
Silicon Graphics, Inc. (415) 960-1980	Iris 3130	68020	NA	Yes	8-16	NA	Unix System V, Unix 4.2	Ethernet, TCP/IP, NFS	1,024 x 768	$59,900
	Iris 4D/60 Turbo Option	Proprietary	10	Yes	8-16	NA	Unix System V.3, Unix 4.3	Ethernet, TCP/IP, NFS	1,280 x 1,024	$64,900-$72,300
Sun Microsystems, Inc. (415) 960-1300	3/50 series	68020	1.5	68881	4	71-282*	Unix 4.2, Unix System V	NA	1,152 x 900 (mono)	$4,995
	3/60	68020	3	68881	4-24	71-282*	Unix 4.2, Unix System V	NA	1,152 x 900 (mono)	$7,900
	3/100 series	68020	2	68881	4-16	71M-1.2G*	Unix 4.2, Unix System V	NA	1,152 x 900 (mono, color)	$15,000-$19,900
	3/200 series	68020	4	68881	8-32	280M-1.2G*	Unix 4.2, Unix System V	NA	1,600 x 1,280 (mono), 1,152 x 900 (color)	$28,900
	4/200 series	MB86900	10	NA	8-128	280M-1.2G*	Unix 4.2, Unix System V	NA	1,600 x 1,280 (mono), 1,152 x 900 (color)	$39,900

**Computerworld* estimates based on vendor-supplied information.

[1] Reduced instruction set computing [2] Transmission Control Protocol/Internet Protocol [3] Network File System [4] Systems Network Architecture [5] Manufacturing Automation Protocol [6] Xerox Network System [7] Binary synchronous communications

The companies included in this chart responded to a recent written survey conducted by *Computerworld*. Further product information is available from the vendors.

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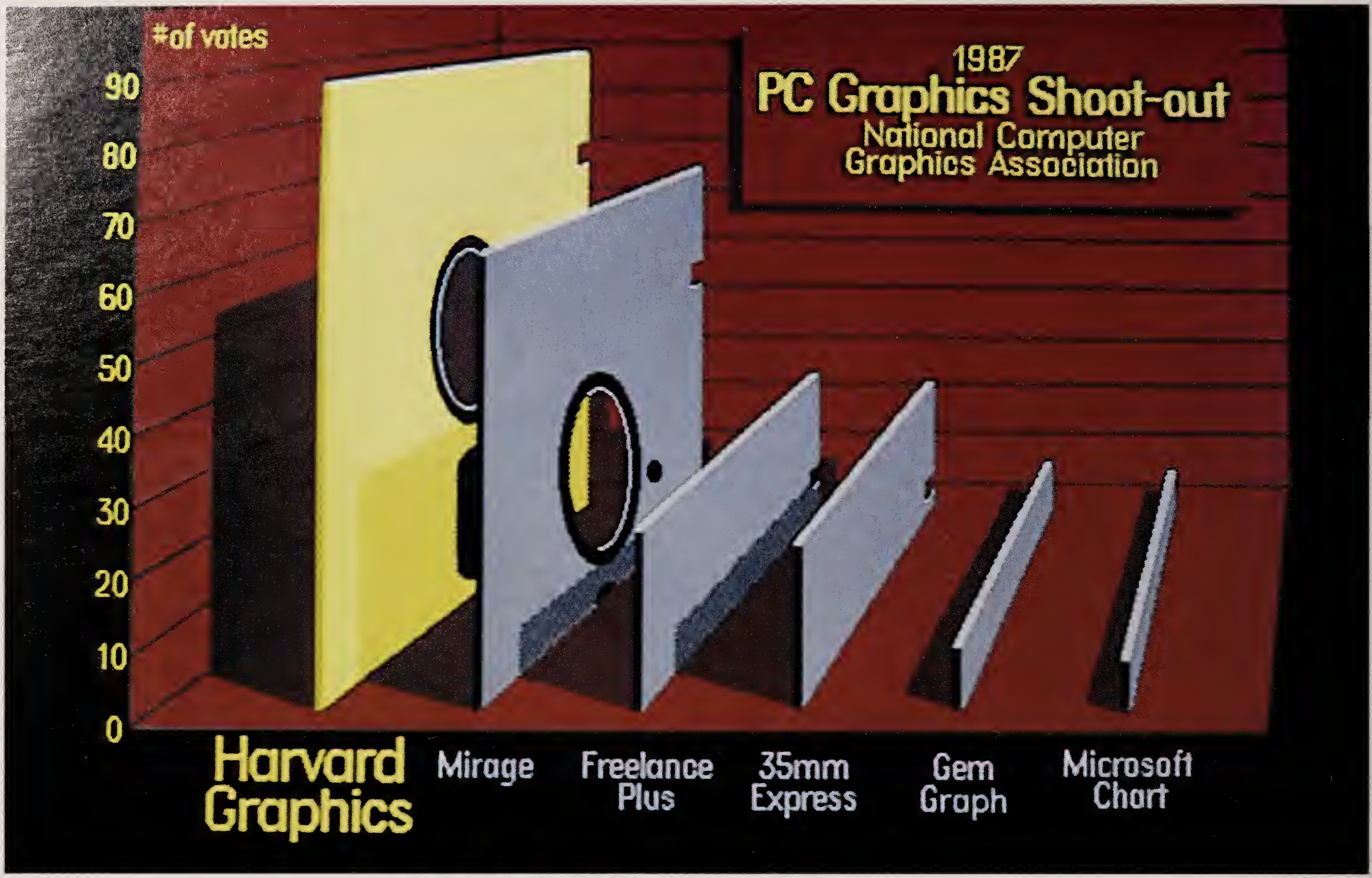

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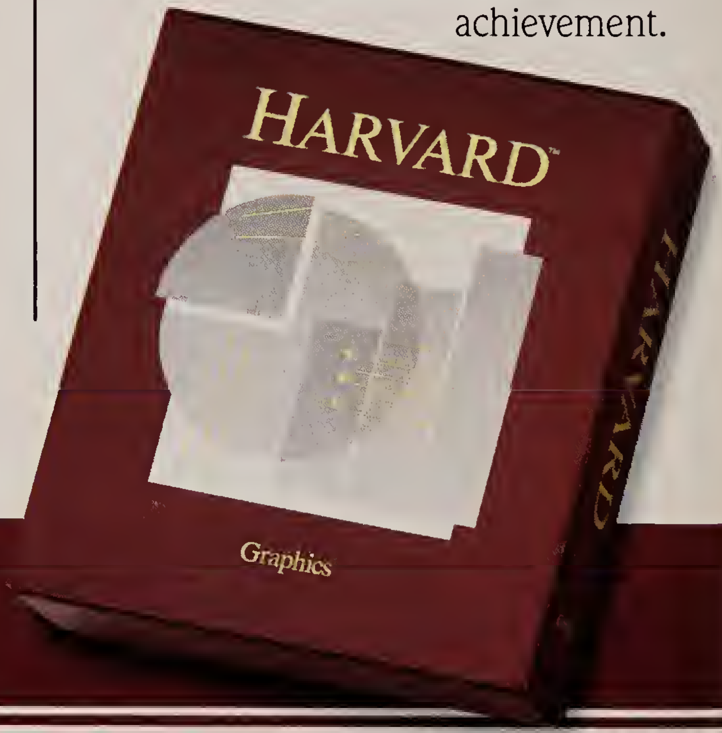

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Leader: Jim Herman, director, Telecommunications Consulting Group, BBN Communications Inc.

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T-3 Managing Mixed Vendor and Local Networks
Leader: Dr. Kenneth Thurber, president, Architecture Technology Corp.

This session will provide a thorough study of the issues involved in managing mixed vendor and local networks, stressing the function characteristics and capabilities of various designs and gateway technologies. Discussion includes LAN-based systems, Ethernet and token-ring gateways and LAN-to-LAN gateways. You'll learn how to evaluate and implement various technologies and products including those expected in the future. **Who should attend:** Especially useful for DP managers systems analysts, marketing managers and others who need to know how to manage mixed vendor local networks.

T-4 Comparing All-In-1 and other Office Automation Architectures
Leader: Amy Wohl, president, Wohl Associates

Examining the status of DEC's All-In-1 in today's office environment, this seminar discusses current applications, as well as those likely to evolve in the future. A comparison of All-In-1 with competing architectures, such as those offered by IBM, includes a look at how it fares in an ever-changing market. **Who should attend:** A good choice for professionals who currently use All-In-1 and for those who are considering new architectures for their communications network.

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Finance trends spark MIS jobs

Investment banking fertile field for trained computer professionals

BY DALE F. FARMER
SPECIAL TO CW

MIS positions in finance companies are among the most lucrative, and major changes in key markets are likely to further their advantage. Deregulation, a strong bull market on Wall Street and the explosive growth of the mutual fund market are fueling the expansion of investment firms and making them more competitive.

"The simple fact of competition causes increases in compensation for MIS," says Terry Ebert, manager of finance administration and operations recruiting for Morgan Stanley Group, Inc. in New York. "The first product of investment banking is information, which is why MIS is so important. Investment banking markets information and knowledge, and MIS is an integral part of the investment banking structure."

Besides market trends, improved computerized stock trading systems and advancements in technology — providing faster speeds, higher transaction volumes and greater accuracy — are making MIS an even more valuable resource.

Investment and finance companies offer a great deal to MIS professionals in search of opportunity, challenge, growth and money, according to executives in the industry.

"Finance is a growth industry, unlike manufacturing. More and more jobs are being created," says Shree Navkal, senior vice-president and MIS director for Putnam Investment Companies in Boston. "Companies realize the importance of the systems area and are willing to make the necessary monetary investment in hardware, software and people."

MIS double duty

In finance, MIS professionals are required to understand two industries: MIS and investment banking. Many firms emphasize in-house continuing education programs that help MIS professionals keep abreast of technical and business changes.

For professionals with a variety of technical skills and business acumen, the opportunities seem unlimited. Employees with IBM systems expertise possess a particular edge, Navkal says, because "many large institutions have large IBM mainframes and need CICS, MVS/XA, VTAM and VSAM experience."

There is also a strong demand for communications professionals. "Putnam has had a 300% growth in terminals in the last year alone," Navkal says.

Other skills in demand include a technical knowledge of personal computers, which are becoming more popular for sales and analysis applications.

Data base systems such as Software AG of North America, Inc.'s Adabas, Cullinet Software, Inc.'s IDMS and Oracle Corp.'s Oracle are more widespread than five years ago and are becoming a necessity in an information-based industry.

> "COMPANIES REALIZE the importance of the systems area and are willing to make the necessary investment."
>
> SHREE NAVKAL
> PUTNAM INVESTMENT SERVICES, INC.

But even professionals knowledgeable in these technical disciplines must possess a second level of ability to succeed.

"Probably more important than individual technical expertise is the ability for an MIS professional to act as a manager as well as a technician — a person who is also a business professional," Ebert says.

Senior MIS managers in investment companies tend to be very knowledgeable from both a business and a technical standpoint and tend not to be generalists. A specific background in the investment or finance disciplines is as important as good technical experience. And, as always, a person who can assimilate all of the changes occurring in both the business and technical schools of thought will be of tremendous importance to an employer.

The disadvantage of the finance environment is that professionals are required to work at a faster pace, with tighter deadlines and a higher level of pressure than their counterparts in other industries. However, many professionals thrive on such demands. In today's expanding market, there is "not a moment of boredom and a new product every week," says one industry expert, who declined to be identified.

Opportunities in the field are found in the Northeast corridor of the country, especially in New York, Boston and Washington, D.C.

"There is growth internationally as well as domestically," Ebert says. "The London market is growing tremendously. Clearly, New York leads, but all investment banks are increasing in other areas, including the D.C. area and on the West Coast."

San Francisco and Los Angeles appear to be experiencing an upsurge in growth in investment firms. In addition, 24-hour-a-day investment and stock trading are creating opportunities in London and Tokyo.

Healthy salaries

For those with the ability and the drive, there is an excellent compensation level.

A recent salary survey of nearly 1,500 MIS professionals that was conducted by *Computerworld* and the Data Processing Management Association shows that banking and investment services are second only to utility companies in overall salaries for MIS professionals.

Add to this the fact that New York offers, on average, some of the highest salaries — with Boston not too far behind — and MIS professionals in investment firms receive a double advantage.

MIS vice-presidents in banking and finance reported receiving a mean salary of $77,538, with MIS directors following close at $65,485. Systems and programming managers reported receiving $52,686, project managers reported a healthy $45,752, and project leaders reported a mean salary of $41,921.

Farmer is a security administrator for Financial Technologies, Inc. in Chantilly, Va.

NEBRASKA PUBLIC POWER DISTRICT

Nebraska Public Power District, one of Nebraska's largest utilities with over 2,000 employees, has three immediate openings for Systems Analysts in our General Office located in Columbus, Nebraska

Information Center Systems Analyst

Applicants must possess a Bachelor's degree in Business Administration, Engineering, or Data Processing or the equivalent in education, training and experience. Three to five years experience with end-user computing tools including personal computers and strong oral and written communication skills is required. Experience with an IBM mainframe computing environment or an Information Center environment is highly desirable

Responsibilities include creation and implementation of end-user training classes, on-going support for end-user products, and support of policies and procedures related to use of end-user products Related duties include consulting, research and development, and participation in special projects as required

Systems Analyst - Business Applications Development

Applicants must possess a Bachelor s degree in Information Science, Computer Science, Business Administration or the equivalent in education, training, and experience Four years experience developing application systems in a business setting including project management duties is required Experience with METHOD/1 is preferred Desired experience in abilities include development of information systems using formal systems development methods, knowledge of IBM mainframe technologies, and experience in training systems development personnel.

Responsibilities include developing and implementing information systems development methods and procedures, assisting in the selection and implementation of hardware, software, and courseware needed to support the systems development methods; training and counseling systems developers in the use of standard methods and automated systems development tools

Systems Analyst - Real Time Systems

Applicants must possess a Bachelor's degree in Engineering, Electronics Technology, or equivalent in education, training, and experience with emphasis in Real Time Systems analysis and design. Two to three years experience in computer-based process systems and knowledge of data acquisition hardware, associated interfaces, and computers is required. Knowledge of DEC-based concepts is desired

Responsibilities include specifying, developing, installing, and maintaining real time computer software systems

Nebraska Public Power District offers a competitive starting salary and excellent benefits package which includes relocation assistance. The state of Nebraska offers the "Good Life" to individuals seeking good schools, excellent recreational facilities, and wide-open spaces.

Qualified applicants, please send resume with salary requirements to

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Human Resources Division
P.O. Box 499
Columbus, NE 68601

EOE

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For consideration of employment, candidates should possess 3 to 5 years experience in one or more of the following hardware/software environments:

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Experience with Yourdon or other structured methodology, MSA, Hogan, McCormick and Dodge, UCCEL software packages: Banking/Financial systems; or Utility Company exposure would be additionally desirable.

For consideration call 800/527-4907 (in Texas call 214/960-7053) or send your resume in confidence to:

Corporate Recruiting
Cutler/Williams Incorporated
4000 McEwen South, Suite 200
Dallas, Texas 75244

CUTLER/WILLIAMS
Information Management Services

EEO/M/F/H/V

Data Processing

VAX SYSTEMS PROGRAMMER

NATIONAL COMPUTER SYSTEMS, a leader in financial system software, is seeking a Systems Programmer with experience in VAX VMS and DEC layered products.

To qualify, you should have a college degree or technical school certification in Data Processing or equivalent work experience, as well as a minimum of two years as a VAX Systems Programmer. In addition, you should be able to prioritize multiple tasks and interact in a team environment.

The successful candidate will be responsible for evaluating, testing and implementing DEC VAX software products, as well as trouble shooting internal and customer problems.

For immediate consideration, send your resume to:

Mrs. Fran Puglisi
National Computer Systems
959 Route 46 East • Parsippany, NJ 07054

Equal Opportunity Employer

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TP Systems Performance Analysis

PRODUCT POSITIONING AND TUNING

Several opportunities exist, including management, to provide data and models of systems operating in transaction processing environments. Responsibilities include performing benchmarks, characterizing Digital's products' performance, developing, tuning and configuring guidelines, analyzing competitor offerings and evaluating design and strategy alternatives in support of systems planning, systems architecture and technology groups.

A BA/BS or equivalent in computer science or a related technical discipline is required; MS/PhD is desirable. You must have at least 3 years' performance analysis experience in analytic and/or simulation modeling; large-scale mainframes used in TP environments; and operating systems.

WORKLOAD CHARACTERIZATION

Join this unique group specializing in the characterization of TP applications. You will research and analyze the anatomy of application systems in different industries, defining the relationship between the business units and computer resources. You will conduct application audits using a variety of techniques including interviews, questionnaires and computer performance measurement tools. The results of your studies will be entered into a knowledge base that will help both marketing and engineering organizations understand the users' needs.

We seek individuals with advanced degrees in business or operations research and at least 5 years' experience in evaluating, designing and implementing TP systems. Strong communications skills are required; as well as familiarity with computer performance issues.

MODELING AND PERFORMANCE TOOLS EVALUATION

Explore the usage and availability of modeling, simulation and performance analysis tools. Where necessary, design tools and methods for computer performance data collection. Assist product positioning and workload characterization groups in selection and implementation of computer performance measurement techniques. Participate in developing a knowledge-based system that will configure computer systems according to business application needs.

You must have an MA/MS or equivalent in computer science or a related discipline and 3 years' experience in the areas of performance analysis, capacity planning, and modeling or simulation of computer systems.

SOFTWARE DEVELOPMENT

Work on a team of software engineers. Design, develop and debug an applications characterization and evaluation system to be used by marketing and engineering organizations to assess workloads and system configurations. Utilize expert systems techniques and provide user-friendly interfaces. Design, develop and debug TP benchmark applications for testing hardware configurations (both Digital and other vendors).

A minimum of a BA/BS or equivalent in computer science or a related field is required. At least 3 years' experience in software development. Knowledge of VMS* is desired.

TP Systems Design Consulting

CONSULTANTS

Our design consulting group has many opportunities for technical consultants looking for significant customer interaction and for the challenge of analyzing the customer's existing or proposed system design needs to ensure the desired performance, functionality and capacity requirements are met. Responsibilities will include the analysis of design requirements and proposal of systems configurations that not only meet today's needs, but also scale to meet tomorrow's needs. Candidates should enjoy travel and have a BSEE/CS or equivalent, a minimum of 5 years' experience designing and implementing TP systems, and excellent communications skills.

TP Systems Quality

MANAGER PRODUCT ENGINEERING QUALITY

The challenge of this position is to establish and prioritize concrete systems quality goals for out transaction processing products. This involves assessing current status, proposing specific intermediate goals, actions and projects, and monitoring the progress and status of all related activities that affect system quality.

You should have a software quality background, at least 10 years' experience in industry, including a background in management and consulting. A bachelor's degree is desirable.

Several other opportunities exist for Systems Quality Managers who have a hardware quality background.

TP Software Engineering

SOFTWARE ENGINEERS

Participate in the design, development and delivery of high performance TP systems. Areas of focus include forms management, DBase management, networking, PCs, graphics, software performance tuning, Clusters and test system development. Ideal candidates will have experience as VAX/VMS user or developer, 5+ years of software development experience, knowledge of MACRO 32 as well as commercial and scientific languages.

TP Software Services

SOFTWARE SPECIALISTS

Our software services engineering group has several opportunities available for software specialists. You will provide high-level, on-site technical support to our customers, perform field test support and develop software services courses.

You should enjoy travel, have a BSCS or equivalent and at least 2 years' experience in VAX/VMS, transaction processing and large commercial applications.

For TP Software Services positions only, send your resume to: **Fred Arno, Department 1005 7804, Digital Equipment Corporation, Continental Boulevard, Merrimack, NH 03054.**

Be part of the team. Send your resume now to: **Martha Minnick, Department 1005 7804, Digital Equipment Corporation, 200 Forest Street, MRO1-1/M5, Marlboro, MA 01752.**

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Programmer Analysts
(Applications Development)

With the acquisition of Goodyear's defense systems business, Loral, a Fortune 500 international company, has earned a rightful place as a leading company in the growing defense electronics industry. Successful candidates must have good analysis background in business applications, preferably in a manufacturing environment with CICS & DL/1 required. Minimum 4 years programming experience in IBM environment; excellent problem solving capabilities along with good oral/written communication skills and a degree in Computer Science or Business, or equivalent. Working knowledge of COPICS or equivalent systems a plus.

Systems Programmer

Individual selected must be a communications specialist familiar with SNA, VTAM & NCF. Good oral/written communication skills with a degree in Computer Science or Business, or equivalent and a minimum 4 years experience as a Systems Programmer required.

Arizona offers a sunny Southwest lifestyle and year 'round recreational activities. Resumes with salary history may be sent to: **LORAL DEFENSE SYSTEMS, Attn: Barbara Seyfried, Human Resources Dept. CW1005, P.O. Box 85, Mail Drop #4213, Litchfield Park, AZ 85340.** *All candidates must be able to provide proof of the legal right to work in the U.S. Affirmative Action/Equal Opportunity Employer.*

LORAL
DEFENSE SYSTEMS—ARIZONA

(Formerly Goodyear Aerospace Corporation)

SENIOR SYSTEMS ANALYSTS

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Our challenge is to apply emerging technology in novel and flexible ways to accommodate today's requirements while anticipating future needs in fields related to electronic information storage, online access and information delivery.

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If you are motivated by challenging assignments and exciting career opportunities—the environment you are looking for is at **OCLC!** Join us at our headquarters in Dublin, Ohio (metropolitan Columbus). We are currently seeking data processing professionals with a minimum of 8 to 10 years' experience in the design and development of large interactive online systems. Qualified candidates should have an overall broad background with design capabilities at the operating systems and applications level to provide leadership and creativity for existing projects. Experience with any of the following would be a plus: TANDEM/TAL, DEC VAX/VMS/ULTRIX, IBM OS/MVS, Guardian, UNIX, C language, Assembler and administrative/project management. A BS in Computer Science is highly desirable.

We offer an outstanding company-paid benefits program (hospitalization, major medical, dental, group life, disability), plus 4 weeks vacation, a modern working environment and salary commensurate with experience. For confidential consideration, please send your resume and salary history/requirements to:

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Dublin, OH 43017

OCLC

Online Computer Library Center, Inc.

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Citizens Federal Savings with assets in access of $2 billion is seeking qualified applicants for the positions of Applications Group Manager and Sr. Applications Programmer. These individuals will assist in implementation of major IBM banking software packages and provide continued support after conversion. Applicants must have 2-3 years banking applications experience, preferably UCCEL, and be conversant in COBOL. Knowledge of CICS, MVS, and VSAM desired. Send resume and salary requirements to:

Personnel Director
Citizens Federal Savings
110 North Main Street
Dayton, Ohio 45402

Equal Opportunity Employer

APPLICATION PROGRAMMER

CW Transport, a major transportation company, located in central Wisconsin has an immediate opening for a programmer. Experience and qualifications should include a minimum of 3 years exp in an IBM DOS/VSE environment using CICS, Assembler, COBOL and VSAM. Send resume to:

Director of MIS
CW Transport Inc.
610 High St.
Wisconsin Rapids, WI 54494
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An immediate career opportunity is available for an experienced LINC II programmer on a Unisys A-Series, DMS II Database, and Data Communications. We are migrating our application systems implementing software packages and developing application systems in a Unisys A - 3 environment utilizing LINC II. The John Day Co. is a well established, highly respected distributor of agricultural, industrial and contractor supplies and serves the midwest through locations in 4 states. A very competitive salary, a good environment and a secure future will be offered to the selected candidate. Send your confidential resume to:

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Dept. C • Cherry Hill, NJ 08002

Dublin Hall, Suite 201, Dept. C
1777 Walton Rd. • Blue Bell, PA 19422
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Omaha, NE 68106
(402) 397-8107

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Prestigious corp located in SE FL seeks "IMS" pro. Min 3 yrs IMS DB/DC application programming. Join large IBM online development team. Excellent career path/benefits. Relocation paid by company.
Salary to **$42,000**

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Conn div of major corp seeks exp'd MIS mgr. Bkgd w/invty, warehousing, shipping & purchasing sys pref'd. Degree, IBM & DEC exp a +. Excellent benefits, full reloc. Salary to **$68,000**

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Come to work in beautiful northern Wisconsin. Manufacturer seeks experienced Cadam programmer with skills in Fortran and OS/JCL. Exciting company to join. **$27-33,000**

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Salaries range to **$36,000**

PROGRAMMER ANALYST PACKAGED SYSTEMS

New MVS shop starting in the Midwest needs your COBOL programming experience and knowledge of McCormack & Dodge, MSA or similar Financial Packages. Salary to **$37,000**

CICS SYS PROGRAMMER OZARKS!

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Tool mfr seeks candidate with 2+ yrs IBM S/36, RPGII and Mapics experience. Co closed between Christmas & New Yrs + 2 weeks vacation.
Salary to **$35,000**

PROGRAMMER/ANALYST

Large prestigious garment co req's 5+ yrs COBOL exp in a Hewlett Packard environment. Knowledge of PC networking a +.
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PROGRAMMER ANALYSTS

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We have a select number of opportunities available for experienced computer professionals with 3 years background in COBOL programming in a modern IBM environment. You should have working knowledge of JCL and MVS/OS, with a track record of independent, results-oriented career growth. A four year technical degree or equivalent experience is required. CICS or IDMS background would be a plus.

Qualified candidates will be involved in new design/analysis and maintenance activities, with responsibility for user contact. Project leadership assignments may expand and enhance your career challenge. Excellent salary and benefits are supported by career development and growth potential, limited only by your current and projected skill level. For details or a confidential interview appointment, send a resume or detailed letter of inquiry to:

Information Systems Recruiter T15
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900 Euclid Avenue
P.O. Box 5937
Cleveland, OH 44101

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* DOS and MVS Computer Operators
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We offer excellent employee benefits, profit sharing and relocation assistance. Please send your resume to:

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SENIOR BUSINESS ANALYST - MANUFACTURING

To conduct structured business and computer analysis, producing functional specifications reflecting user needs to form the basis for systems development. To control system testing, implementation and the development of user procedures.

SYSTEMS & OPERATIONS SUPERVISOR - PRIME

The Systems and Operations Supervisor will have full responsibility for directing and co-ordinating the functions of the systems operations support group in the operation of the present triple PRIME 850 CPU complex and the 100+ attached and stand-alone micro computers. He will have further responsibility for planning future enhancements and upgrades and supervising their implementation by the group which currently consists of a systems programmer, systems administrator and seven computer operators working on a 24 hour shift system.

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To work as senior members of development teams on the specification and implementation of a variety of manufacturing, accounting or MIS systems. Candidates should have 4 years plus experience in COBOL and on-line or database systems.

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To support the operational auxiliary systems including PC's, graphics and word processing. To evaluate hardware and software requirements for support systems. Candidates should have 4 years relevant experience and good communication skills.

All candidates should have education to Degree level or equivalent with at least 5 years relevant experience.

Please write enclosing your cv quoting ref: 5279 to Ian Murray West.

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- **TECHNICAL WRITING**
- **MODEL 204**
- **DATACOM/IDEAL**
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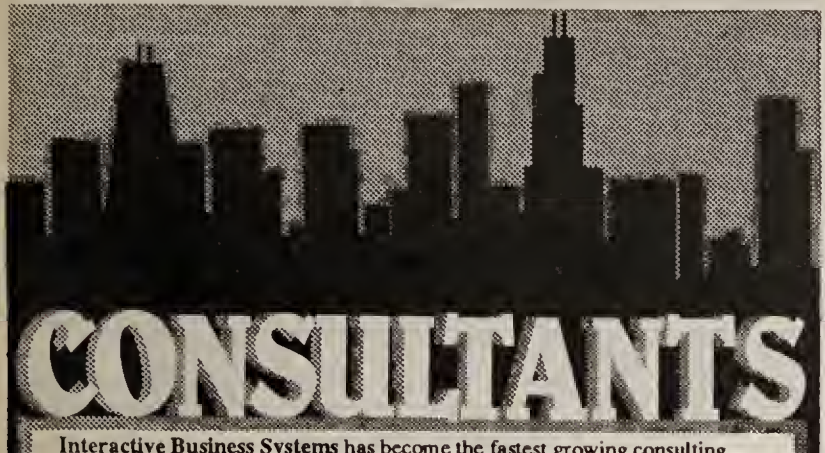

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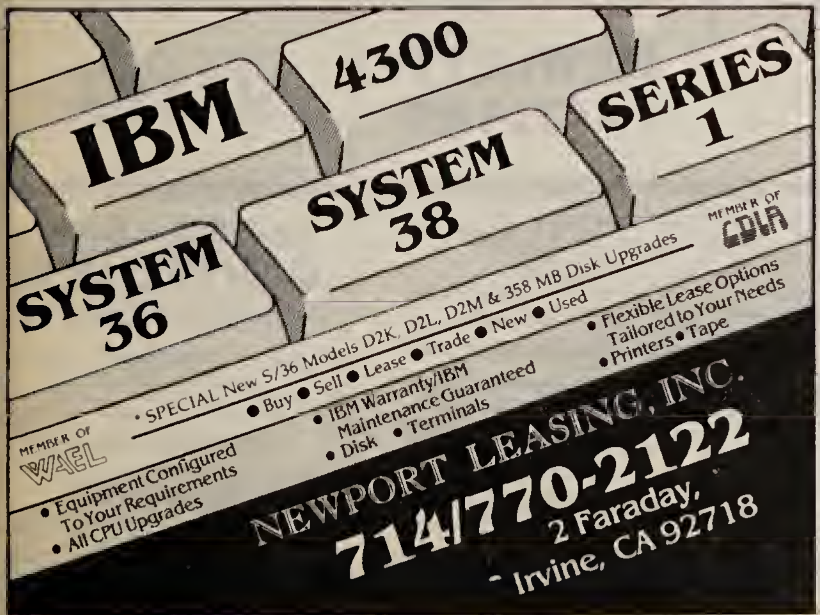

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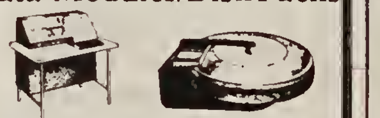

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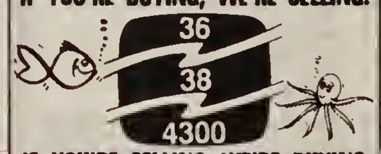

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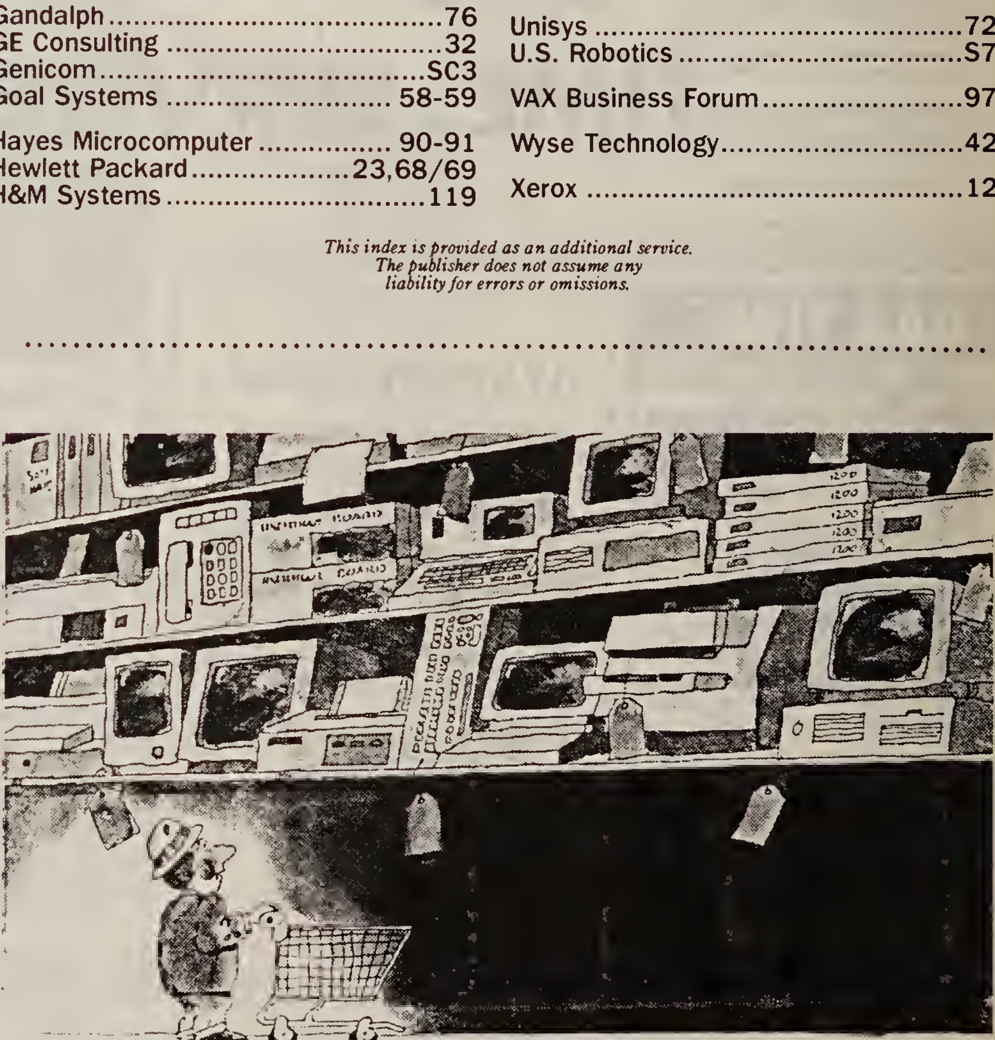

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Nov. 16	Communications	Oct. 30
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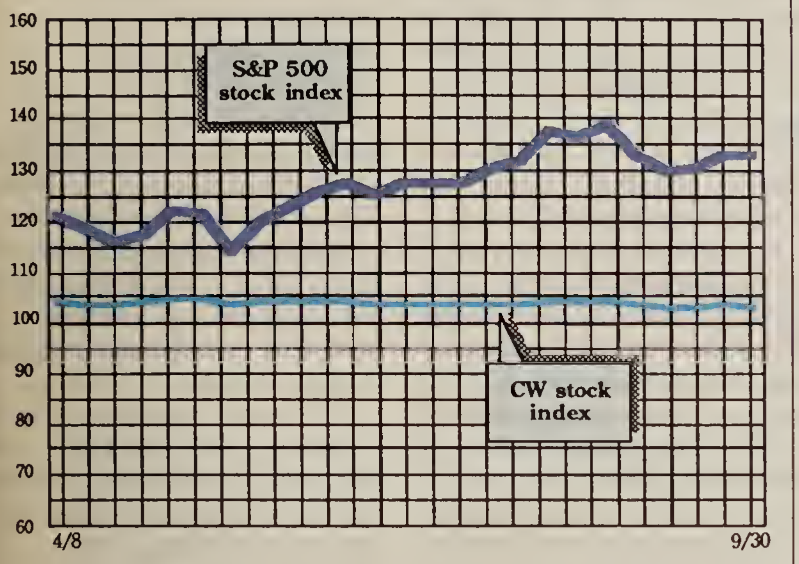

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Computer Systems	129.9	**131.5**
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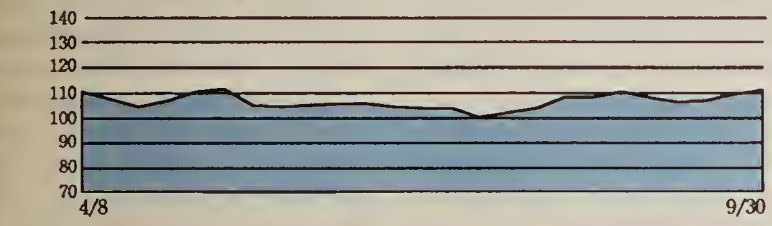
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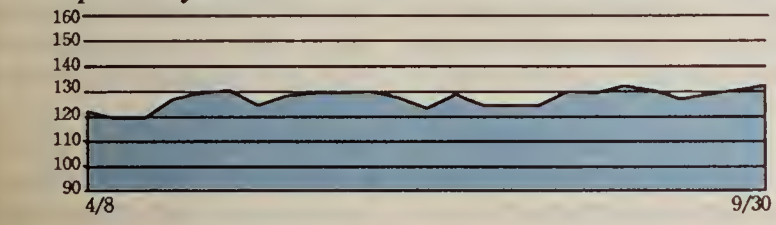
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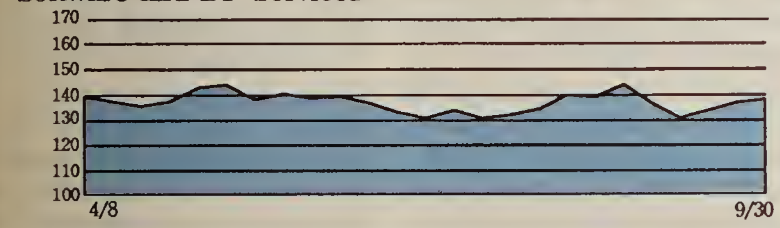
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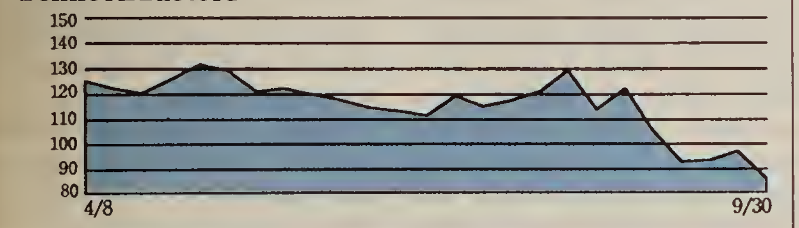
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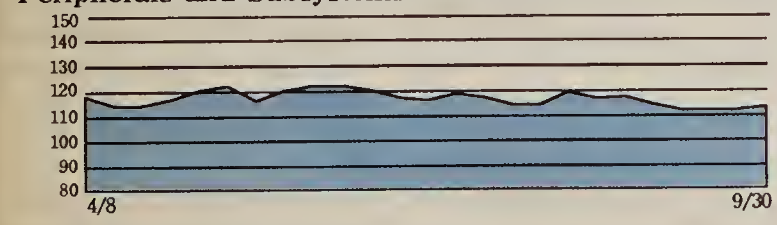
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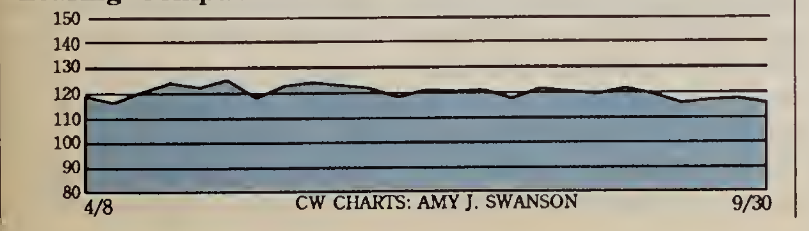
Leasing Companies

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPT. 30, 1987

Communications and Network Services

EXCH		PRICE				
		52-WEEK RANGE (1)		CLOSE SEPT. 30 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	100	77	95.38	-1.5	-1.5
Q	ANDREW CORP	19	14	15.75	+0.5	+3.3
Q	ARTEL COMM CORP	5	2	2.75	+0.0	+0.0
N	AT&T	36	22	33.75	-0.3	-0.7
Q	AVANT GARDE COMP INC	7	3	5.06	+0.3	+6.6
Q	AVANTEK INC	19	13	15.25	-0.6	-3.9
N	AYDIN CORP	38	18	34.13	-0.5	-1.4
N	8ELL ATLANTIC CORP	80	62	76.63	-2.5	-3.2
N	8ELLSOUTH CORP	44	35	42.13	+0.3	+0.6
Q	8RIDGE COMMUNICATION	29	12	28.44	+0.4	+1.6
Q	COMPRESSION LA8S INC	8	4	5.75	+0.5	+9.5
O	COMPUTER NETWORK TECH	6	3	4.44	+0.6	+14.5
O	CDNTEL CORP	40	27	36.88	+0.8	+2.1
Q	DATA SWITCH CORP	9	5	7.88	+0.5	+6.8
Q	DIGITAL COMM ASSOC	49	19	43.75	+0.8	+1.7
Q	DYNATECH CORP	44	25	25.50	-1.8	-6.4
Q	EQUATORIAL COMM CO	5	2	3.25	+0.0	+0.0
Q	GANDALF TECHNOLOGIES	11	5	7.88	+0.6	+8.6
Q	GENERAL DATACOMM INDS	14	7	7.00	-0.3	-3.4
N	GTE CORP	45	34	41.50	-0.3	-0.6
Q	INFOTRON SYS CORP	12	7	7.75	-0.5	-6.1
N	ITT CORP	66	48	62.13	+0.3	+0.4
N	M A COM INC	16	12	13.13	-1.1	-7.9
Q	MCI COMMUNICATIONS CORP	11	5	10.50	+0.6	+6.3
Q	MICOM SYS INC	18	10	12.00	+1.D	+9.1
Q	NETWORK SYS CORP	19	9	10.25	+0.0	+0.0
N	NORTHERN TELECOM LTD	24	14	22.25	-0.6	-2.7
Q	NOVELL INC	27	10	26.00	+D.5	+2.0
N	NYNEX CORP	78	59	76.75	+1.0	+1.3
N	PACIFIC TELESIS GROUP	34	23	32.38	+1.4	+4.4
N	PARADYNE CORP	9	4	7.13	-0.1	-1.7
A	PENRIL CORP	6	4	4.13	-0.1	-2.9
N	PLESSEY PLC	41	24	35.88	+1.3	+3.6
N	SCIENTIFIC ATLANTA INC	20	9	16.88	-0.5	-2.9
N	SOUTHWESTERN BELL CORP	46	33	43.88	+1.1	+2.6
Q	3 COM CORP	24	11	21.00	+0.9	+4.3
N	TIMEPLEX INC	41	15	29.38	+0.5	+1.7
Q	UNGERMANN BASS INC	16	8	9.75	+1.3	+14.7
N	U S WEST INC	60	45	58.88	+0.4	+0.6

Computer Systems

EXCH		52-WEEK RANGE (1)		CLOSE SEPT. 30 1987	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLIANT COMPUTER SYS	37	15	15.25	-1.5	-9.0
Q	ALPHA MICROSYSTEMS	7	3	4.88	+0.1	+2.6
Q	ALTOS COMPUTER SYS	17	10	14.00	+0.1	+0.9
A	AMDAHL CORP	49	19	47.13	-1.1	-2.3
Q	APOLLO COMPUTER INC	25	12	20.50	+0.5	+2.5
Q	APPLE COMPUTER INC	59	16	56.50	+1.3	+2.3
N	BDLT BERANEK & NEWMAN	30	19	23.00	+2.3	+10.8
Q	BRITTON LEE INC	5	3	3.50	-0.3	-6.7
N	COMPAQ COMPUTER CORP	73	15	72.50	+11.4	+18.6
Q	COMPUTER AUTOMATION INC	17	2	14.50	+0.5	+3.6
A	COMPUTER CONSOLES INC	12	4	4.63	-0.5	-9.8
Q	CONCURRENT COMP CORP	24	13	20.75	+1.5	+7.8
N	CONTROL DATA CORP DEL	38	24	35.25	-1.4	-3.8
Q	CONVERGENT TECH	12	4	6.63	-0.5	-7.0
Q	CONVEX COMPUTER CORP	22	8	13.25	-1.0	-7.0
N	CRAY RESH INC	136	69	92.88	-0.9	-0.9
Q	DAISY SYS CORP	13	7	7.88	+0.1	+1.6
N	DATA GEN CORP	39	25	32.88	+1.3	+4.0
N	DATAPOINT CORP	9	4	8.25	-0.1	-1.5
N	DIGITAL EQUIP CORP	198	90	189.75	+0.4	+0.2
N	FLOATING POINT SYS INC	17	8	8.75	+0.1	+1.4
N	GOULD INC	25	16	24.25	+1.1	+4.9
N	HARRIS CORP	43	28	38.00	-1.3	-3.2
N	HEWLETT PACKARD CO	71	37	70.50	+0.5	+0.7
N	HONEYWELL INC	91	58	79.38	-0.9	-1.1
N	IBM	176	116	150.75	-3.5	-2.3
Q	INFORMATION INTL INC	17	13	13.75	+0.8	+5.8
Q	IPL SYS INC	3	2	2.75	-0.1	-4.3
Q	MASS COMPUTER CDRP	13	5	12.25	+1.3	+11.4
N	MATSUSHITA ELEC INDL LTD	195	93	192.00	+15.0	+8.5
Q	MEGADATA CORP	7	2	5.00	-0.5	-9.1
Q	MENTOR GRAPHICS CORP	37	14	34.25	+0.1	+0.4
N	NBI INC	14	8	11.25	+D.4	+3.4
N	NCR CORP	87	42	82.38	+D.5	+0.6
N	PRIME CDMPUTER INC	31	16	25.38	-1.8	-6.5
Q	PYRAMID TECHNOLOGY	12	4	10.00	+1.5	+17.6
Q	STRATUS COMPUTER	41	18	32.75	+3.3	+11.0
Q	SUN MICROSYSTEM INC	46	14	36.25	-D.1	-0.3
Q	SYM8OLICS INC	7	4	3.69	-0.2	-4.8
N	TANDEM COMPUTERS INC	38	17	33.25	+1.5	+4.7
N	TANDY CORP	56	32	52.25	+1.9	+3.7
N	ULTIMATE CORP	37	13	37.00	+2.0	+5.7
N	UNISYS CORP	48	23	44.63	-D.1	-0.3
A	WANG LABS INC	19	11	17.63	+0.1	+0.7

Software & DP Services

EXCH		52-WEEK RANGE (1)		CLOSE SEPT. 30 1987	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ADVANCED COMP TECH	5	3	3.75	-0.5	-11.8
N	ADVANCED SYS INC	29	12	26.5D	-0.5	-1.9
N	AGS COMPUTERS INC	25	9	23.50	+2.1	+9.9
Q	AMERICAN MGMT SYS INC	19	7	18.13	+1.1	+6.6
Q	AMERICAN SOFTWARE INC	22	8	13.38	+0.5	+3.9
N	ANACOMP INC	11	3	1D.50	+0.1	+1.2
Q	ANALYSTS INTL CORP	9	3	8.00	+0.D	+0.0
Q	ASHTON TATE	30	14	27.50	+1.3	+4.8
Q	ASK CDMPUTER SYS INC	17	10	13.50	-1.0	-6.9
Q	AUTODESK INC	34	11	27.5D	-1.8	-6.0
N	AUTO DATA PROCESSING	55	32	50.13	-2.4	-4.5
Q	BDOLE & 8A8BAGE INC	12	5	10.25	-0.3	-2.4
N	COMPUTER ASSDC INTL INC	35	11	32.50	-1.9	-5.5
Q	COMPUTER HORIZONS CORP	15	10	12.00	+0.4	+3.2
N	COMPUTER SCIENCES CORP	69	31	68.50	+3.6	+5.6
N	COMPUTER TASK GRDUP INC	18	12	15.13	-0.1	-0.8
Q	COMSHARE INC	28	11	22.75	-0.3	-1.1
N	CULLINET SOFTWARE INC	14	6	12.50	-0.3	-2.0
Q	CYCARE SYS INC	11	7	9.38	-0.4	-3.8
Q	DUQUESNE SYS INC	33	14	18.75	+2.5	+15.4
Q	ENDATA INC	16	6	15.88	+0.4	+2.4
N	GENERAL MTRS (CLS E)	5D	24	48.25	+D.1	+0.3
Q	HOGAN SYS INC	17	8	B.75	+0.6	+7.7
Q	INFORMIX CDRP	2B	8	26.75	+3.5	+15.1
Q	INTELLICDRP INC	11	4	5.25	-0.5	-8.7
Q	KEANE INC	1D	5	B.38	+D.0	+0.0
Q	LOTUS DEV CORP	37	13	33.25	+D.0	+0.0
Q	MANAGEMENT SCI AMER	21	11	12.88	-0.1	-1.0
Q	MICRO PRD INTL CORP	8	2	6.06	+0.1	+1.1
Q	MICROSOFT CDRP	67	14	66.25	+6.0	+10.0
Q	NATIONAL DATA CORP	34	19	28.88	-0.9	-2.9
Q	ON LINE SOFTWARE INTL INC	22	6	19.00	+1.6	+9.4
Q	ORACLE SYS CORP	34	7	32.50	+2.8	+9.2
N	PANSOPHIC SYS INC	25	12	24.13	+2.3	+10.3
Q	POLICY MGMT SYS CORP	30	15	26.00	+0.8	+3.D
Q	PROGRAMMING & SYS INC	14	8	13.00	+0.5	+4.0
Q	REYNOLDS & REYNOLDS CO	39	27	30.50	-0.8	-2.4
Q	SEI CORP	18	8	16.25	+0.3	+1.6
Q	SHARED MED SYS CORP	53	23	26.13	-0.9	-3.2
Q	SOFTWARE AG SYSTEMS INC	19	10	12.38	-0.1	-1.0
Q	SOFTWARE PUBG CORP	17	5	9.75	+0.3	+2.6
A	STERLING SOFTWARE INC	16	9	10.50	-0.4	-3.4
Q	SUNGARD DATA SYS INC	21	10	17.25	-0.5	-2.8
N	SYS. SOFT INC.	21	14	20	+0.3	+1.3
N	URS CORP	23	13	19.63	-0.6	-3.1
Q	VM SOFTWARE INC	45	13	15.25	+0.3	+1.7

Semiconductors

EXCH		52-WEEK RANGE (1)		CLOSE SEPT. 30 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADV MICRO DEVICES INC	25	13	22.00	-0.4	-1.7
N	ANALOG DEVICES INC	24	14	19.25	+1.8	+10.0
Q	ANALOGIC CORP	13	10	10.38	-1.0	-8.8
Q	INTEL CORP	59	18	57.75	-0.3	-0.4
Q	LSI LOGIC CORP	17	8	12.75	-0.4	-2.9
N	MOTOROLA INC	72	34	69.88	-0.8	-1.1
N	NATL SEMICONDUCTOR	19	8	18.38	-0.5	-2.6
N	TEXAS INSTRS INC	78	35	74.75	-2.6	-3.4
A	WESTERN DIGITAL CORP	33	13	23.63	+0.0	+0.0

Peripherals

EXCH		52-WEEK RANGE (1)		CLOSE SEPT. 30 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	AM INTL INC	9	5	6.88	-0.8	-9.8
Q	AST RESH INC	23	11	15.63	-3.5	-18.3
Q	AUTO TROL TECH CORP	9	3	6.00	+0.3	+4.3
Q	8ANCTEC INC	16	7	12.88	+0.6	+5.1
Q	CIPHER DATA PRODS INC	18	9	10.75	-0.4	-3.4
A	COGNITRONICS CORP	5	2	4.25	+0.3	+6.3
N	COMPUGRAPHIC CORP	27	19	27.13	+0.6	+2.4
N	COMPUTERVISION CORP	23	13	14.25	+0.1	+0.9
A	DATAPRODUCTS CORP	16	10	11.63	-0.4	-3.1
A	DATARAM CORP	9	7	7.63	-0.1	-1.6
N	DECISION INDS CORP	13	7	11.25	-0.1	-1.1
N	EASTMAN KODAK CO	104	53	101.88	+0.9	+0.9
Q	E M C CORP MASS	29	9	22.00	-1.0	-4.3
Q	EMULEX CORP	10	6	8.13	+0.9	+12.1
Q	EVANS & SUTHERLAND	40	21	27.00	-1.3	-4.4
Q	ICOT CORP	13	5	6.50	+0.1	+2.0
Q	INTERLEAF INC	21	8	19.25	+0.4	+2.0
Q	IOMEGA CORP	8	2	2.88	+0.1	+4.5
Q	LEE DATA CORP	10	5	5.25	-0.1	-2.3
Q	MASSTOR SYS CORP	6	3	3.88	-0.2	-4.6
Q	MAXTOR CORP	34	10	13.63	+0.5	+3.8
Q	MICROPOLIS CORP	44	16	28.38	+0.8	+2.7
Q	MINISCRIBE CORP	18	7	15.63	+0.8	+5.0
N	MINNESOTA MNG & MFG CO	84	50	81.75	+1.6	+2.0
A	MSI DATA CORP	24	11	23.00	+0.1	+0.5
Q	PRIAM CORP	6	2	2.75	+0.1	+4.8
Q	PRINTRONIX INC	13	10	11.25	-0.1	-1.1
N	QMS INC	27	12	24.63	-1.0	-3.9
Q	QUANTUM CORP	35	15	16.75	+0.5	+3.1
Q	RAMTEK CORP	6	4	5.50	+0.1	+2.3
N	RECOGNITIDN EQUIP INC	27	12	15.75	-0.6	-3.8
Q	REXON INC	14	6	8.00	+0.8	+10.3
Q	SCAN TRON CDRP	17	11	13.00	+D.0	+0.0
Q	SEAGATE TECHNOLOGY	46	15	18.38	-1.4	-7.0
N	STORAGE TECH CORP	5	2	2.88	-0.1	-4.2
Q	TANDON CORP	7	2	3.38	+0.3	+8.0
A	TEC INC	7	3	5.25	+0.4	+7.7
N	TEKTRONIX INC	43	30	35.00	+0.6	+1.8
Q	TELEVIDEO SYS INC	3	2	2.69	-0.1	-2.3
N	TELEX CORP	102	46	51.63	+5.8	+12.5
Q	WYSE TECH	37	13	37.13	+3.6	+10.8
N	XEROX CORP	85	51	79.00	-0.6	-0.8
Q	XIDEX CORP	16	11	12.38	+0.6	+5.3

Leasing Companies

EXCH		52-WEEK RANGE (1)		CLOSE SEPT. 30 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	35	16	34.00	+1.3	+3.8
N	CONTINENTAL INFO SYS	14	7	9.88	-0.3	-2.5
Q	PHOENIX AMERN INC	8	3	4.75	+0.1	+2.7
Q	SELECTERM INC	7	5	4.50	-0.5	-10.0
N	U S LEASING INTL	55	42	48.75	+0.0	+0.0

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL;
O = OVER-THE-COUNTER; S = SPLIT

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Compaq attack

Micro maker takes off as new 386-based systems impress

Compaq Computer Corp. is on a roll.

At the end of the week of Sept. 21, the Houston-based microcomputer maker's stock soared to new highs on speculation about its new Intel Corp. 80386-based systems. Last week, after the products were unveiled, investors sustained that momentum.

Compaq rose 6⅞ points in two days Sept. 24 and 25 to close the week at a new high of 68. Last week, the bulls kept charging, and Compaq jumped an additional 7¼ points in the first four days to 75¼. The stock traded as low as 14⅞ within the past year.

The micro software Big Three continued to climb last week. Microsoft Corp., showing steady growth since it split earlier this year, jumped 6½ points to close Thursday at a new high of 68½. Ashton-Tate gained 2⅜ to 30⅛, edging near its high for the year. Lotus Development Corp. was up 1 point to 34¼.

IBM, which has lagged behind several of its competitors in the recent computer stock rally, ended a roller-coaster four days down slightly. After falling a total of 5½ points Monday and Tuesday to 150½, IBM recouped 3⅞ points Thursday to 154⅝, down 1⅜ for the four-day period.

CLINTON WILDER

Showgoers hungry for distributed tools

BY CHARLES BABCOCK
and ALAN ALPER
CW STAFF

NEW YORK — MIS professionals went to the Information Management Exposition & Conference '87 show last week looking for business functions that could be distributed to personal computers and relational products based on SQL.

Staged for the second time in the glass-and-strut Javits Convention Center in Manhattan, the show attracted business people looking for new technology. A swarm of attendees clustered around IBM's display of Personal System/2 models, while nearby IBM exhibits on the System/36 and Solutionpac software were sparsely attended.

"I'm looking for PC-based systems," said Andrew Kotchouby, DP director at Train Smith Counsel, a personal investment advisory firm in New York. Kotchouby was looking for business management products that would work on an IBM Token-Ring local-area network (LAN).

"I envision the future to be distributed data processing based on PCs. Only number crunching and merging of files will still be done on the mainframe," said Kotchouby. His firm relies on 18 PCs and uses a service bureau for its limited mainframe processing.

"A lot of people are shopping for PC packages, which we don't offer," complained Mark A. Potenzone from behind the counter at the Westinghouse Management Systems Software booth, a mainframe software supplier.

In search of . . .

Vernon Whitt, vice-president of marketing at TII, a Long Island, N.Y.-based manufacturer of voltage regulators, came looking for desktop publishing systems. "I'm trying to get away from a $50,000 to $60,000 printing bill for simple product data sheets," he said. After watching a demonstration on an IBM PS/2 Model 25, he noted, "I still don't see a clean, integrated way to put a page together."

Bonita Lei, manager of MIS at Hearst Cable, was attempting to sort out IBM's plans for its PS/2 operating system and its System/36 minicomputer. "It looks like we're going to be able to process things faster on a PC LAN than on the System/36," she said.

Who's the SQL expert?

Representatives of a recent installer of DB2, The Prudential Co. in Roseland, N.J., watched closely as an Oracle Corp. representative demonstrated an SQL query building product. "We've been selling SQL products for longer than IBM," Oracle's Michael Wallace said.

Mark H. Miller, programmer/analyst at The Prudential Insurance Co. of America, said he wanted to find a product that allows a PC user to formulate SQL queries that run against the mainframe data base.

His co-worker, Albertine Senske, said her firm will consider buying Oracle, not as a replacement for DB2, but to be used "in conjunction with DB2."

Expert systems for the mainstream DP environment made a stronger appearance at this year's show than previously. Exhibitors included Aion Corp., which offers an expert system shell, and Information Builders, Inc., the New York firm offering demonstrations of its Level 5 knowledge-based system building shell.

Ashton-Tate and Lotus Development Corp. fielded large exhibits at the exposition after passing up PC Expo two weeks earlier.

Amdahl buffs science line

Amdahl Corp. last week announced improvements to its line of large-scale scientific processors, including the debut of four extended-performance models and what Amdahl said is a fourfold increase in main memory.

Prices of the Series E models start at $3.5 million, and the units will be available in the second half of 1988, Amdahl announced at the Information Management Exposition & Conference '87 show last week.

The Series E performance improvements reflect the development of a multifunction arithmetic pipeline that can execute new compound instructions in parallel with existing arithmetic pipelines, Amdahl claimed.

Peak performance levels have risen to 286 million floating-point operations per second (MFLOPS) for the Model 500E, 429 MFLOPS for the 1100E, 857 MFLOPS for the 1200E and 1.7 billion FLOPS for the 1400E.

AT&T forging PC software alliance

BY PATRICIA KEEFE
CW STAFF

AT&T has quietly entered into a comarketing venture with a small software publishing start-up in St. Louis in an effort to gain exclusive rights to packages based on MS-DOS that are currently under development.

AT&T is seeking products for markets such as compact disk/read-only memory, or CD-ROM, artificial intelligence and communications.

The original plan was to unveil the venture with Strategic Support Services, Inc. (SSSI) along with a number of products at Comdex/Fall '87 next month in Las Vegas. However, the start-up period has taken longer than expected, and sources said they no longer expect the venture to produce any software until next year.

According to sources close to SSSI, the company has talked to at least 100 software developers under nondisclosure agreements and is currently negotiating with about a half-dozen developers. Some of the products could be on the market as soon as early next year, a source close to the company said.

Neither AT&T officials nor SSSI's president could be reached for comment.

To explore software

The objective of SSSI is "to get AT&T heavily into software," said a source close to SSSI. Several analysts characterized SSSI as AT&T's response to recent moves by IBM and Apple Computer, Inc. to bolster development of application software for their hardware.

IBM reorganized its application software resources into a new organization, the Application Systems Division, in July [CW, July 27]. Earlier this year, Apple announced plans for Claris, which will be spun off as an independent software publishing venture devoted to developing Macintosh applications at some point next year.

"It could be AT&T's answer to [those announcements], especially in keeping SSSI at arm's length, much as Apple has done with Claris," said Andrew Seybold, editor-in-chief of "Andrew Seybold's Outlook," a Santa Clara, Calif.-based newsletter.

Much as Apple has done in the past, AT&T is said to be looking for unique packages in new markets that will attract prestige and buyers alike.

"They are probably trying to invigorate their PC line," said John McCarthy, director of research at Forrester Research, Inc. in Cambridge, Mass. "It sounds like they can't compete on hardware, so they'll try to compete on software."

On the positive side, collaborating would enable AT&T to provide its major accounts with list pricing or other discounts, according to Al J. Lynd, a consultant and publisher of the "Edge, On and About AT&T" newsletter, located in Morristown, N.J.

Cullinet

FROM PAGE 1

as a completely different company. Chairman David Chapman described a future release of IDMS/R as "a whole new product, one that will coexist with DB2 and IDMS/SQL."

Coexisting with IBM was not part of Cullinet's vocabulary a few years ago, when it was the leading independent DBMS provider to the IBM mainframe world. But it was that dependence on the mainframe market — which skidded to a nearly no-growth status — and the emergence of IBM's DB2 that caused Cullinet's recent series of losing quarters and forced it to institute the current changes.

Cullinet crap game

Cullinet's attempted comeback is a high-stakes gamble, both because its plans are so ambitious and because many of the products it involves will not be commercially available for at least another year, according to industry observers. Yet Cullinet President George Tamke disputed that. "The pieces of the puzzle are being put on the table," he said. "Lots of it is here and now, if you include beta-test products."

Company executives also claimed that the time lag of one to two years before products become commercially available will not hurt the firm.

"We're talking 15 months, and I don't think we'll see much improvement to DB2 in that time," Tamke said. "Let's not minimize the work [IBM has] to do on DB2."

"I believe [Cullinet] will come back, but it sounds like they want to be everything to everybody and solve their problems by coming out with 12 products a year," said David Johnson, vice-president of the financial management department at Northern Trust Co. in Chicago.

"There's no question our plate is now full, but we think we have it all under control," said Cullinet founder John Cullinane, who recently retired as chairman.

Back to the blueprint

Last week's product announcements were made up of new items as well as updates on the progress of products that were introduced a year ago. Cullinet first introduced its grand plan as the "blueprint strategy" in September 1986. Topping last week's statements were the following:

- The next release of IDMS/R, which will include full SQL support, is scheduled for beta shipment by the end of 1988. Known internally as Release 11, the product will be so different from the current DBMS that it will likely get a name change, company executives said.
- Release 10.2 of IDMS/R, now at beta-test sites, is slated to be generally available by year's end. The release is Cullinet's initial SQL implementation for mainframe-based DBMSs in that only the query mechanism has SQL support.
- DB2 support for Cullinet's fourth-generation language and development system, ADS/Online, is scheduled for beta shipment in mid-1988.
- IDMS/SQL, Cullinet's flagship VAX product, which has full SQL support, is scheduled to be commercially available in the first quarter of 1988. Jeffrey Papows, Cullinet's vice-president of marketing, said the product went out to six beta-test sites at the end of September, making it "a few weeks behind schedule."
- Releases of both the Goldengate and Infogate packages for the IBM Personal Computer are slated to become generally available in November. Goldengate will include a new report writer and a word processing component that is a modified version of Professional:Write from Software Publishing Corp.
- A suite of development tools will be gradually released throughout the next 18 months. The products include two versions of Application Expert, a tool for developing knowledge-based systems in the VAX and IBM CICS environments. An IBM PC version is scheduled for beta shipments in mid-1988, along with a version that works with Cullinet's ADS/Online development system.
- A release of Cullinet's human resources application software that includes "function and technical changes" is scheduled for availability in June 1988.

Interviews with several Cullinet User Week attendees indicated that while many users are worried, few have reached the point of looking for another vendor.

"It seems they had some financial problems, and all of a sudden they went off in a bunch of different directions," said one systems manager from a utility company who requested anonymity. "We've met with them and had encouraging statements, but we're still going to take a cautious approach."

System/38 users' growing pains

Many still anxiously await upgrade path after hitting capacity wall

BY JAMES CONNOLLY
CW STAFF

IBM's public discussions about its Silverlake mid-range project have failed to inspire users frustrated by the lack of options available to those who have outgrown the capabilities of the largest System/38.

Emotions ranging from concern to anger have been building as speculation has heated up regarding the hybrid System/38 and 36 processor code-named Silverlake, a second System/38 follow-on believed to be called Olympia and any enhancements for the existing System/38 product line.

Some users report they have outgrown the processing power and communications capabilities of the high-end System/38 Model 700, which was introduced in June 1986. Those users and the consultants who work with them in configuring and managing their systems have expressed frustration with the lack of a growth path and the shortage of information from IBM.

Meanwhile, however, those users reaffirmed their loyalty to the System/38, whose data base architecture and programming tools were considered revolutionary when it was first delivered seven years ago.

"We feel the horsepower we have is sufficient to satisfy our needs for a year or so. What we are concerned about is networking, where we are limited to 12 communications controllers," said a Model 700 user at a Midwestern manufacturing firm who asked not to be identified.

Another user, who said his two Model 700s and six other System/38s are running at no more than 50% capacity, cited the 12-line communications limit as a concern but also questioned how much Silverlake would help him if it is delivered next year, as IBM officials have said.

David Funderburke, MIS director for the Dallas-based Trammell Crow Co. real estate firm, said, "I think they are promising something for the middle of next year, but what I expect is that they will replace the low end, essentially the System/36 end. I haven't heard about there being any more for us at the high end."

Funderburke said the communication limits prevented Trammell Crow from expanding services to remote users. "There are ways around the problem, but I would like to see IBM address it," he added, noting that he is dissatisfied with options third-party vendors offer.

IBM says add CPUs

Several observers reported that rather than promising a more powerful System/38, which they said could hurt sales of a follow-on product, IBM has been telling Model 700 users to add CPUs when they outgrow the 32M-byte Model 700.

"In most cases, that is feasible. The exception is if you have one application or file that can't be divided among several systems," said David Andrews, president of Andrews, Duerr & Manteghian, Inc., a Cheshire, Conn., consulting firm specializing in System/38s. "IBM tells its people that it doubles performance every 18 months. But everyone is concerned about whether IBM will come out with a Model 800 or Model 900 before Silverlake. The number of customers with Model 700s that are starting to creak and groan is significant."

Andrews said 10 of 20 Model 700 users polled recently reported they either had or were getting a second CPU to deal with capacity problems.

He said the limitations on using a second CPU include a lack of channel connections, which means the fastest communications between systems is 64K bit/sec. under the CCITT X.25 standard. Andrews added that the System/38's single-level storage concept prevents multiple CPUs from sharing disk drives and that problems also arise when CPUs are linked through IBM's Distributed Data Management facility because it does not offer record locking.

One user, who accused IBM of "jerking users around," complained that he gets little information about a high-end growth path. Clint Griggs, a programmer/analyst for the National Association of Letter Carriers in Washington, D.C., said his organization is considering an upgrade to a Model 700 from a System/38 Model 40, which was the high-end System/38 before the Model 700.

'Interim fix,' not solution

"Silverlake, in my personal opinion, is not a solution for people who have capacity problems. It's an interim fix for people who have compatibility problems with the System/36 and System/38. Silverlake is not the answer for us." Griggs said.

"The 38 is the best machine on the market, period. And nobody is more satisfied with their machine than the 38 users. That is why I would hate to have to go to another vendor," he added.

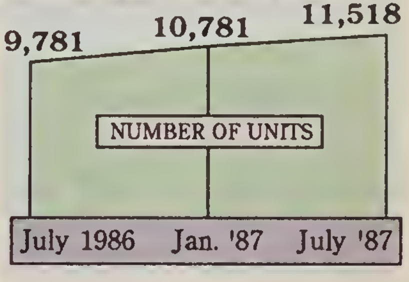
Griggs' complaint with Silverlake, based on what he has "heard through the grapevine," is that it appears to be an enhanced System/36 that runs System/38 programs as an afterthought. He cited reports that Silverlake will include RPG-II as a standard offering but that users will pay for RPG-III, which is popular with System/38 users.

Griggs also questioned when Olympia will arrive. He said Olympia appears to promise greater performance than Silverlake but may not be a true System/38. He said his immediate concern is having a growth path through the Model 700 with more power and memory and enhancements to clear up "quirky little bugs" in the System/38's operating system.

Consultant Tony Nicassio, general manager of Application Design & Systems, Inc. in Los Angeles, said there may be renewed confidence in IBM. Six months ago, he said, users were adding CPUs; now they "seem to be waiting for whatever new technology may be coming."

Room to grow

IBM's increasing System/38 U.S. installed base awaits expansion options



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHART

IBM: Rest assured

When asked what IBM recommends customers do when they run out of capacity on a Model 700, a company spokeswoman responded with this four-point answer:

- IBM has indicated that all user application investments will be preserved in any follow-on product.
- The company has indicated that such a follow-on product will not be announced until 1988.
- Processor hardware costs are only a small portion of a customer's overall investment, so a customer who delays processor purchases "fails to take advantage of the rest of his investment."
- Logical growth strategies include horizontal growth paths, and IBM offers several features to help customers use multiple System/38s.

IBM barrage

FROM PAGE 1

last week, Culhane also predicted the imminent arrival of a five-CPU 3090 and discussed an alternative mainframe architecture he said is under development.

Culhane said IBM will speed up announcements of projects under development in an effort to differentiate the 3090 from the 3080 line, which also runs the MVS/XA operating system.

Right now, many sophisticated users are opting to buy used products from the 3080 line or to lease them while awaiting the arrival of the Summit line of processors, which is expected in 1992.

IBM feels compelled to freeze the market while its development staff completes advanced-function products for the 3090s, Culhane claimed. "They're using the announcement mechanism to take care of product shortcomings," he said.

Among the highlights of Culhane's view of IBM's upcoming releases are the following:

- A five-way version of the 3090 processor, to be announced sometime in November. The extra, or asymmetrical, processor would be available for backing up on-line transactions to disk.
- F models of the 3090 line, to be announced in early 1988, possibly in February, with delivery in the third quarter. The F models will run 20% faster than current E models and could offer a degree of fault tolerance through the addition of an asymmetrical fifth processor to handle on-line backups. The F series would range in power from 38 million instructions per second (MIPS) for a dual processor to 100 MIPS for a six-way processor.

The IBM customer said the company informed him that the next 3090 kicker will come early next year and offer up to 100 MIPS. He said IBM claimed it would offer a 25% performance improvement. Also, he reported IBM said the 3090 will not grow in size beyond six processors.

- An enhanced 3480 cartridge tape drive, to be announced early next year to ward off compatible devices just beginning to be shipped by other vendors.
- A major reduction in the price of memory, both cache and main, sometime this fall. The move will be made to correct the imbalance between mainframe memory prices of $3,000 per megabyte and far lower prices for PC and minicomputer memory.
- A total of 6M byte/sec. channel speeds, in the third quarter of 1988. The timing is intended to coincide with early shipments of the new IBM 3990 disk drive controller, which will support data transfer of 6M byte/sec.
- Serial fiber-optic channels, sometime in the second quarter of 1988. Due to their coherent signal, these channels would allow users to back up CPU data from a remote disk drive site up to seven kilometers away. Users now must locate system disk drives within 400 ft of the processor to which they are attached.

Several users and consultants have said they believe IBM will implement fiber-optic channels in its next generation of storage devices.

- MVS/XB, the updated extended-address operating system for large IBM systems. In conjunction with extended Expanded Storage features, the new software could boost 3090 performance by 30% to 35%. Buffer size would also increase, due to a changeover from 64K- to 128K-bit chips. The IBM customer said he was informed MVS/XB will provide greater addressing.

Upgrades lead to Summit

The 3090 enhancements were designed to tide users over until the end of 1989, when the large-scale Summit series is expected to be announced, Culhane said.

The series will be built around a 45-MIPS uniprocessor. A dual-processor version will deliver 85 MIPS, while a quadratic processor will provide 155 MIPS. IBM is expected to extend Summit to an eight-way processor in the early 1990s, and a new generation of software designed to take advantage of Summit's hardware features probably will not be available until 1992.

The IBM customer said he was informed that Summit is intended to be launched in 1990, with enhanced Summit models following in 1991 and 1992. After the initial Summit rollout, lower level models will be added, he said.

The customer said he was assured Summit will not infringe on the price/performance of the 3090, which will still be marketed. Additionally, he said, IBM promised fiber-optic channels and controllers, which will function as data switches, and that Summit will use a vector facility to aid DB2 performance.

Culhane confirmed industry speculation that IBM was preparing an alternative mainframe architecture, hedging its bet that the Japanese computer makers will not deliver on fifth-generation technology until 1992.

Culhane said the new processor, code-named Planet, will have a 47-bit address space, parallel processing and up to one billion instructions per second capability. Planet will cost users $35,000 to $45,000 per MIPS, the Gartner Group says, while Summit will be priced at $75,000 to $85,000 per MIPS.

AST 386 to use AT bus with Micro Channel hook

BY JAMES A. MARTIN
CW STAFF

IRVINE, Calif. — AST Research, Inc. will reportedly unveil on Oct. 19 an Intel Corp. 80386-based microcomputer featuring a proprietary bus structure that offers features similar to the IBM Personal System/2 Micro Channel architecture, *Computerworld* has learned.

The Premium/386 is said to feature an enhanced IBM Personal Computer AT bus structure that, through AST's proprietary electronic bus signaling codes, will provide a concurrent processing environment similar to the Multi-Device Interface feature on the Micro Channel architecture, according to sources close to the company.

AST's announcement will follow on the heels of Compaq Computer Corp.'s disclosure last week of an enhanced bus structure (see story page 1). Compaq said its Flexible Advanced Systems Architecture will enable software applications to run at faster speeds, in some cases outperforming minicomputers.

In essence, the AST Premium/386 will be compatible with all existing PC and PC AT add-on boards as well as those designed for the Micro Channel. AST is hoping to bridge the gap between the two systems with this introduction and reportedly plans to publish its bus structure specifications in hopes of encouraging standardization.

Mum's the word

AST officials would not elaborate on the details of the planned announcement, although Albert Wong, AST's executive vice-president of advanced technology, disclosed in a Hong Kong briefing last week that AST will unveil a significant alternative in microcomputing this month.

"Our announcement will shake up the marketplace in a number of different ways," said Charles McHenry, a company spokesman. "The other new products announced with it will fill in the void."

The related product announcements will include what sources said will be the first in a series of add-in boards designed to take advantage of the concurrent processing feature on the Premium/386 and IBM's PS/2 Models 50, 60 and 80.

The board is reportedly an enhanced hard-disk controller board with its own microprocessor that will handle multiple disk requests simultaneously. The company would not specify which microprocessor would be featured on the board.

An 80386 add-in card for the Premium/286 is expected to be released soon.

The Premium/386 is expected to run at 20 MHz, feature IBM's Extended Enhanced Graphics Adapter, up to 70M bytes of hard-disk capacity and a 5¼-in. floppy disk as standard, with an optional 3½-in. microfloppy. In addition, the machine will feature 1M byte of memory and will be priced between $5,000 and $6,000, less than Compaq's Deskpro 386.

Apple

FROM PAGE 1

A customized applications software program on the host sends commands to Macworkstation via one of five different communications protocols. Macworkstation acts as a driver "translating" the commands into the Macintosh's graphical user interface. Klein said software developers may write applications in any host language.

Degree of difficulty

The level of customization depends on the mainframe application, Hirshberg said. "If it's designed so that all the routines that deal with the screen display are in one area, it's not that difficult. But if you're dealing with a 15-year-old program where all the routines dealing with the screen are all over the place, changing it could be a nightmare," he said.

The six modules that will be supported are Appletalk, RS-232, Transmission Control Protocol/Internet Protocol, IBM's 3270 terminal, Tandem Computers, Inc.'s 6530 and CCL, a new scripting language used to log on to host computers by Applelink. Using Macworkstation, a user can connect to any one of the modules by entering it into the Macintosh.

A site license will be available to end users for $2,500 or to third-party developers for $5,000. Macworkstation will reportedly only be sold through Apple.

Belmont, Calif.-based Oracle Corp. has obtained Macworkstation for future product development but declined to disclose product plans.

Originally developed for internal use in Apple's MIS department, Macworkstation was released as a scaled down "unsupported product" in 1985. "There was a degree of uncertainty in how Apple should market such a product," Klein said.

Apple reversed its position on Macworkstation last year, pulling it from the market to prepare it for general release, he added.

John DuBois, senior technical adviser for Seafirst Corp., a Seattle-based Bankamerica Corp. subsidiary, said he intends to use Macworkstation for any application requiring a significant amount of user interaction.

"The whole idea of the Macintosh is that people use more and different applications where the user interface is consistent," DuBois explained.

"I probably wouldn't use it in a batch application because there's not much user interface involved," he said, "but I would in a transaction-oriented system. For example, in an electronic-mail application, you could use it, so you don't care or know that you're using a mainframe to send E-mail from the West Coast to New York."

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INSIDE LINES

Still awaiting proof. According to a consultant briefed by IBM, the lackluster RT PC is IBM's "strategic Unix platform" and sits at the center of a series of systems running AIX, IBM's Unix, including the 9370 and the PS/2 Model 80. Now if they can just convince developers to write software and users to buy the thing, they'll be all set.

Holding back the flood. The governing council of the Association for Computing Machinery (ACM) came close to formal consideration of withdrawing from AFIPS. In August, the councilors split 12-12 in a straw vote on whether to hold a special meeting to take up the question. Withdrawal from AFIPS by Sept. 30 would have freed the ACM from any involvement in next spring's National Computer Conference. The group's previously announced withdrawal from direct ownership of NCC takes effect with the 1989 show, after which it will still participate indirectly.

Prime cut. Andy Knowles has resigned as corporate vice-president of advanced projects for Prime Computer in Natick, Mass. According to Prime, Knowles left to "pursue his interest in higher education and will actively contribute as chairman of the board of trustess of the University of Massachusetts." Knowles joined Prime in 1984 after 14 years with DEC and nearly 10 years with RCA in its computer business. At Prime, Knowles explored new ventures and headed the company's CAD/CAM and workstation group.

We giveth, and we taketh. Third-party maintenance companies have had to slash their prices to compete with maintenance discount plans that IBM has been rolling out in the past year. Now, they will have to pay more for parts — and they will have a harder time obtaining those parts from Big Blue. IBM announced last month a parts purchasing plan that dictates that customers must now purchase parts at one of 21 designated field parts centers instead of at IBM branch offices, of which there are more than 100 nationally. In addition, IBM hiked the surcharge on emergency orders from $5 to $25 and added a charge of $250 for emergency orders placed outside of regularly scheduled hours.

Ashton-Tate's ship coming in. Dbase Direct/36, a connectivity product currently marketed by Ashton-Tate in the UK, will arrive stateside late this month. While users cannot update files on the IBM System/36, they can access these files, which appear as MS-DOS files, without leaving Dbase. According to Ashton-Tate insiders, this is the beginning of a broad connectivity strategy.

Wishful thinking. Ashton-Tate last week publicly confirmed that the SQL implementation of Dbase IV will not be able to access host data bases. Sources, however, report that third-party vendors hope to fill that gap and provide some form of Dbase IV SQL to host connectivity.

Luck of the draw. Developers who shelled out $3,000 for Microsoft's OS/2 Software Developers Toolkit have been happily coding or just sifting through the 75 pounds of disks and documentation. The few developers who opted for the cheaper IBM tool kit are not so lucky: They haven't received anything.

Next at bat. The 3174 appears to be the next candidate in IBM's campaign to systematically migrate LU6.2 and PU.2.1 — its two mainline peer-to-peer protocols — to all of its major computing systems and communications processors, according to Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. The move would be a logical step after last June's announcement of PU2.1 implementation on IBM's 3725 and 3720 front-end processors. Still missing: direct support for PU2.1 on IBM's 9370 departmental processor.

Kahn-speak. When low-priced software kingpin Borland International acquired Ansa Software, Borland Chairman Philippe Kahn said there will be no price cut on Ansa's $495 Paradox data base. But last week, Borland announced a $100 rebate offer that will extend through Dec. 15. Technically, it's no price cut if the user has to pay the money up front.

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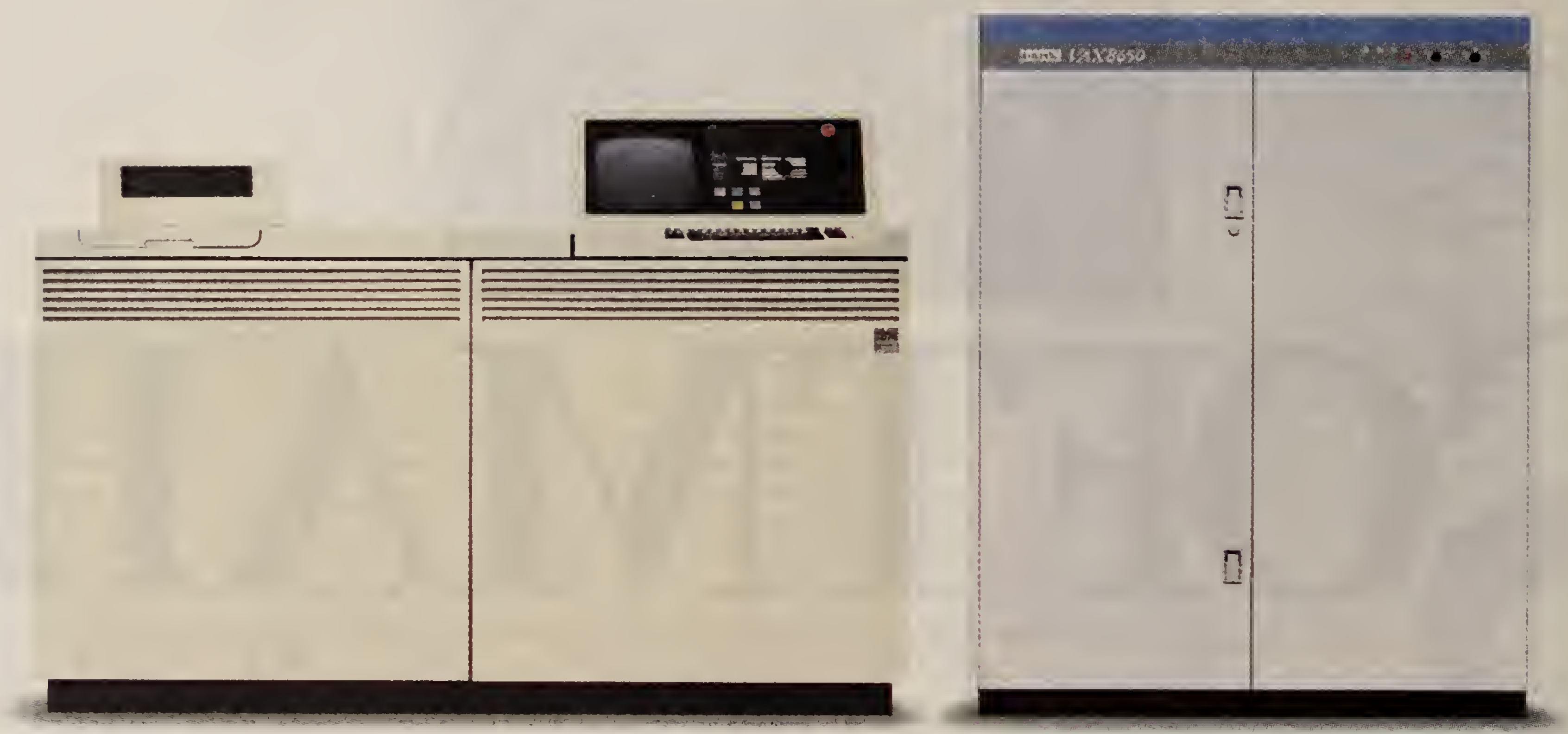

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